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SESSION 1938-1939.

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PROCEEDINGS and REPORTS

of the
Belfast Natural History
and Philosophical Society

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SESSION 1938-1939.

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[ESTABLISHED 1821.]

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Any further information required may be obtained from the Hon. Secretary, at 7 College Square North, Belfast.

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PROFESSOR W. B. MORTON, M.A., D.Sc., Past President, in the Chair.

THE SOCIAL FUNCTION OF EDUCATION.

By A. J. ALLAWAY, M.A.

Social institutions may be looked at from three different points of view:—

- (1) of form,
- (2) of function, and
- (3) of purpose.

They may, in other words, be studied in respect of the arrangement of their parts, of the activity proper to them, or of the ends they exist to serve. In this paper education will be looked at from the point of view of function, will be studied in respect of the activity proper to it.

In most studies the term education has a narrower connotation than that which I wish to give to it in this paper. Education is thought of as applying only to certain kinds of activity of a rather formal character, carried on in schools and colleges and universities. And in many studies such a limited view of the scope of education may well be of service to the purpose in hand. But in the particular study which we are about to undertake it would be otherwise, and therefore a wider view must be taken. The full width of the connotation which I wish to give to the term education will be seen later.

The social function of education is primarily the transmission to the coming generation of the social inheritance, that is, of the knowledge and expedients and habits which were originally the personal acquisitions of individuals, but which have afterwards been handed down from one generation to another by the social process of teaching and learning. The social inheritance embraces not only technical skills, but attitudes of mind and modes of conduct. Examples of the first may be seen in reading, writing and arithmetic, at one end, and the arts, crafts and sciences at the other, while examples of the second and third are to be seen in customs, conventions and social institutions, these last including the state, private property, marriage and the family, etc., with the aura of feeling by which they are surrounded.

The extent and complexity of the social inheritance has continuously increased since the beginning of conventional language and of the art of flint knapping, and this fact is leading to increasing difficulties in education. Whereas two hundred years ago an encyclopaedia was good for fifty years after the date of its publication it is now obsolete in twenty years. These difficulties have been partly met by the devices of recording, which enable us to keep knowledge, when once it has been acquired, ready for use, without the necessity for anyone actually remembering it. They have been partly met by the institution of compulsory education of a somewhat formal character, and by constant increases in the length of school life. And they have also been partly met by a process of specialisation, through which the social inheritance is parcelled out among a large number of separate individuals.

This last method of coping with the difficulties created by the task of transmitting a social inheritance of immense size and complexity was inevitable. No man could possibly acquire to-day more than perhaps one ten thousandth part of it, and each of us must therefore specialise to some extent. But though specialisation is the most effective method it is not without its dangers. One man only in a million may acquire some knowledge or skill upon which the safety of all the rest depends. And small groups of men, because they have a monopoly of a particular kind of knowledge or skill, may extract from society high rewards by threatening to "hold up," as they may well be able to do, much of the social or economic life of the community to which they belong.

Every growth in the size and complexity of the social inheritance increases man's dependence on it. When it was at its smallest and simplest, that is at the dawn of the life of man, the sudden loss of the social inheritance might have led to a fall in population to perhaps one half or one quarter of its former level, but the sudden loss of the social inheritance to-day would possibly lead to the extinction of the most progressive varieties of the human race. Graham Wallas remarks* that ". . . nine-tenths of the inhabitants of London or New York would be dead in a month, and 99 per cent. of the remaining tenth would be dead in six months. They would have no language to express their thoughts, and no thoughts but vague reverie. They could not read notices, or drive motors or horses. They would wander about, led by the inarticulate cries of a few naturally dominant individuals, drowning themselves, as thirst came on, in hundreds at riverside landing places [and] looting those shops where the smell of decaying food attracted them. . . . Even in country districts, men could not invent, in time to preserve their lives, methods of growing food, or taming animals, or making fire, or so clothing themselves as to endure a northern winter. An attack of constipation or measles would invariably prove fatal. After a few years mankind would certainly disappear from the northern and temperate zone."

Man, in other words, has become parasitic upon his social inheritance: he has become more fitted to live with the help of his social inheritance and less fitted to live without it. The primary social function of education, that is, the function of transmitting to the coming generation of the social inheritance, is therefore an extremely important one, and one which, if neglected or ill performed, can only result in social retrogression. It is one, moreover, which our schools, colleges or universities can never wholly fulfil. Home, Sunday school, boys' or girls' club, works or office, trade-union, political party, social club, the Church and its auxiliaries, all play some part.

Almost from the day of his birth the individual is subjected to a process which enables him to acquire skills of various kinds and which condition his responses to various situations. The process may be described as that of the adaptation of the individual to his social environment. Not everyone will, of course, be intended for exactly the same social environment. The dustman's son will be adapted for one and the bishop's son for another. Each will generally be enabled to acquire those skills which will make it possible for him to earn his living in a manner usually considered appropriate to the class to which his parents belong, and the attitude of mind and modes of conduct customary to that class. And each will thus have transmitted to him that part of the social inheritance which is in the keeping of the class into which he is born, and so will the social heritage as a whole be transmitted to the coming generation as a whole.

**Our Social Heritage*, p. 18.

But if a community is to make any progress, or even to feel tolerably certain that it is not to suffer retrogression the social function of education must go beyond the mere transmission of the social inheritance to the coming generation. Where, in fact, communities have failed to do more than fulfil the primary social function of education they have left themselves open to the disintegrative effects of unforeseen changes in the social environment. The Arunta, of Central Australia, are a case in point. Their elaborate and solemn educational arrangements are admirably fitted for the adaptation of the individual to his social environment. The individual is indeed so perfectly adapted that were some part of the social environment to be modified he would be incapable of coping with the problems raised. The gradual disappearance of the Arunta and others of the simpler peoples, which is taking place before our eyes, is due to their inability to cope with problems set by the incursion into their territories of white men, whose activities are a disturbing factor in the social environment.

Sooner or later every community, even the most conservative, is called upon to cope with new and unexpected problems raised by unforeseen changes in the physical or social environment. The exhaustion of an old source of supply of food or of raw materials, the appearance of a new disease, or an increase or decrease in population, may make obsolete old arts and sciences, customs and conventions, and even social institutions, and render new discoveries of one kind or another necessary. In communities less conservative an invention or new discovery, like that of printing, or the compass, or gunpowder, or the microscope, or representative government, or biblical criticism, or of such ideas as nationality, or socialism, or fascism, or pacifism may render necessary the adjustment of tradition in a thousand different ways. And the more perfectly any community fulfils the primary function of education, if it confines itself to that function only, the more unlikely is it to be able to withstand the fissiparous tendencies to which such changes as have been mentioned above give rise.

For the life of the community is organic in character, its parts interact with one another, so that anything which affects one part inevitably affects others too. Let the physical environment change in any particular, or let any invention or discovery take place, and it will be found that, sooner or later, there will arise the need for adjustment in what would at first sight seem most unexpected places. Some communities have sought to escape the necessity for adjustment by preventing any kind of change whatsoever. That is an intelligible method. Others, and these by far the most important in modern times, have permitted some change but have resisted proposals for adjustment rendered necessary by such change. That is not an intelligible method. These have even encouraged change, especially in military, industrial, commercial and medical technique, and at the same time have shown themselves indifferent to, or have opposed, the economic, political and social adjustments necessitated by such change.

The consequence has been a one-sided development to which Sir Alfred Ewing, the famous engineer, drew attention in his Presidential Address to the British Association at the York meeting in 1932 when he said*: "In the present-day thinkers' attitude towards mechanical progress we are conscious of a changed spirit. Admiration is tempered by criticism; complacency has given way to doubt; doubt is passing into alarm. There is a sense of perplexity and frustration, as in one who has gone a long way and finds he has taken the wrong turning. To go back is impossible: how shall we proceed? An old exponent of applied mechanics may be forgiven if he expresses something of the disillusion with which,

*Report for 1932, p. 17.

now standing aside, he watches the sweeping pageant of discovery and invention in which he used to take unbounded delight. . . . Beyond question many of these gifts are benefits to man, making life fuller, wider, healthier . . . but we are acutely aware that the engineers' gifts have been and may be grievously abused. In some there is potential tragedy as well as present burden. Man was ethically unprepared for so great a bounty. In the slow evolution of morals he is still unfit for the tremendous responsibility it entails. The command of Nature has been put into his hands before he knows how to command himself."

There can be no question that if any community is to live happily and harmoniously, or even to avoid acute suffering, it must be possessed of the power and the will to adapt to its needs the social environment as a whole. This implies that it must be able to foresee the probable effects of any change in any part of the social environment, and to judge whether such change is likely to be beneficial or otherwise to the community as a whole, and, in the light of its judgment, to permit or reject such change. And it implies, further, that should such change be permitted the community must have the capacity and the determination to make, in other parts of its life, any consequential adjustments. And this, in a community which is democratic in character, can only be possible if the community generally possesses a readiness to undergo prolonged mental exertion, a capacity for constructive criticism, free, as far as is possible from personal bias, and a will to act upon the judgments arising out of the exercise of that capacity for constructive criticism.

These mental qualities can only be developed by a process of education. And if they are to be fruitful of results, that is, if they are to bring ordered progress, the community must be just as ready to apply them to the traditional attitudes of mind and modes of conduct as to the traditional technical skills, just as ready to ask of the one, as of the other, what are their uses, to enquire whether they really do, as indeed they always profess to do, contribute to human welfare. And if the answer is that they do not, but rather contribute to human ill-fare, the community must be just as ready to replace them, even though they be customs, conventions and social institutions hoary and venerable with age. And in so far as any community enables the coming generation to acquire these mental qualities, together with a readiness to apply them all round, so far is it fulfilling the secondary social function of education, which is the equipment of the coming generation with the means to adapt to its needs the social inheritance.

The social function of education in any truly progressive community is thus seen to consist in the transmission to the coming generation of the social inheritance, and the equipment of the coming generation with the means to adapt the social inheritance to its needs. Primarily it is concerned with conservation, secondarily with development. And each, as everyone will readily concede, is equally important.

Yet in our own community the educational system as a whole, though it fulfils the primary social function of education tolerably well, hardly attempts the secondary function at all. Only in a small section of the coming generation is encouraged a readiness to question and a will to transform the social inheritance, and even in this small section the readiness to question and the will to transform is encouraged only in respect of the traditional techniques. Dustmen's sons, for instance, unless they be exceptional sons of exceptional fathers, are through education enabled to acquire little more than the skills which will enable them to earn their living in a manner generally considered appropriate to the class to which their parents belong, and to live the way of life customary among members of their class. They acquire little more than that part of the social

inheritance which is concerned with the performance of the menial work of the community. They are not encouraged to question why it is to their fathers, and later to themselves, that this work falls; why, though it is of importance to the community, it brings scant rewards, and why dustmen, roadsweepers, navvies and day labourers should occupy a lowly place and lawyers, doctors, clergymen and teachers a relatively exalted place in the social scale.

But what of the sons of bishops? These are undoubtedly encouraged to question and to develop the will to transform, but not to question or transform attitudes of mind, or modes of conduct, expressed in customs, conventions and social institutions. In this they are treated in exactly the same way as dustmen's sons. The questioning and the will to transform are chiefly encouraged in relation to the unsolved technical problems of the industry or profession for which they are being trained. The intelligence and constructive ability of the community, so far as it is provided with educational opportunities, is thus put to the service of what Sir Alfred Ewing called mechanical progress, and with the unfortunate results described by him in the passage quoted above from his Presidential Address to the British Association.

This curious fact finds illustration in a comparison between the rich endowment of research which has a direct bearing on warfare, industry, commerce or medicine and the poor endowment of research which has a direct bearing on crime, poverty, liberty or democracy. Consequently far greater prominence is given to, and much more generous facilities are provided for, the study and application of the principles of the material sciences (the sciences of the non-living) such as physics, chemistry and geology and to the organic division of the vital sciences (the sciences of the living) such as biology, anatomy and physiology, than to the psychical division of the vital sciences, such as politics, social psychology and sociology and to social philosophy also.

And why is it that in our own community education, in so far as it is concerned to fulfil its secondary social function, pays much attention to the critical study of technique and little attention to the critical study of attitudes of mind and modes of conduct? In part it is due to traditional ideas as to the state. The state is still thought of as a *power* organisation rather than as a *welfare* organisation. Health, wealth and military preparedness are therefore regarded as most important. In part it is due to the existence within the state of organised interests. These see in the improvement of technique, industrial, commercial and medical, the furthering of their interests. And since these organised interests possess great influence within the state they are able to ensure that the educational system is so largely directed to the study of science (in its narrower meaning) pure and applied.

In part also, it must be admitted, the one-sided application of the secondary social function of education is due to the fact that, as Bertrand Russell states*: "Men fear thought [and he is here referring chiefly to thought applied to traditional attitudes of mind and modes of conduct] as they fear nothing else on earth—more than ruin, more even than death. Thought is subversive and revolutionary, destructive and terrible; thought is merciless to privilege, established institutions, and comfortable habits; thought is anarchic and lawless, indifferent to authority, careless of the well-tried wisdom of the ages. Thought looks into the pit of hell and is not afraid."

**Principles of Social Reconstruction*, p. 165.

10th January, 1939.

PROFESSOR T. THOMSON FLYNN, D.Sc., President, in the Chair.

THE PEOPLES OF NORTHERN IRELAND.

By J. M. MOGEY, M.A.

Up to the present Ireland has been largely neglected so far as research into the population types of the country is concerned. It is therefore a pleasant task for me to announce that a systematic investigation of the racial types of Northern Ireland is now⁽¹⁾ in progress. The work has been directed from Queen's University and grants to help it have been received from this University, the Royal Irish Academy and the Belfast Natural History and Philosophical Society. I wish to take this opportunity of thanking the Council of the B.N.H.P.S. for their financial assistance.

Our aim is to classify all the racial types in Northern Ireland and to plot their distribution area by area. One type is distinguished from another by differences of physical character such as stature, sitting height, the length, breadth and height of the head and the facial features, that is by features that can be measured accurately and recorded objectively. In addition to this the colour of the hair, skin and eyes, together with the form of nose and ear are recorded. It is to be emphasised that these statistics are not collected for their own sake, as sometimes happens in anthropometric studies, but because of their value in the objective analysis of the population into racial groups.

The first centre chosen for field work was the Ballymoney area of North Antrim. This town is the centre of an agricultural district which has escaped the industrialism of the last century. There are records of a market or fair near the town at Enagh Cross in the early Christian period.

Old maps of the town show no growth during the century 1730-1830, and since that time the changes in size and population have been small. This, then, is an area of static population. Inside the market area of the town the movement of the population has been from the country to the town and, as the town remained almost stationary in population, there must have been a corresponding flow from the town to larger centres of urban development. Thus a representative sample of the townspeople ought to provide a cross section of the types to be found in the market area. Such a sample has now been taken and to amplify and check it a further investigation was carried out in all the small villages which surround the town. The analysis of the data collected is slow work and will take some time. It is now proceeding as quickly as possible. Unfortunately at the moment this part of the work is not complete so it would be premature to state conclusions now. The results will be published as soon as possible.

However, I would like to summarise the present knowledge of the racial composition of the Irish people. The population must consist of all the types which have entered Ireland in pre-historic and historic times plus any new types that have evolved in Ireland in the course of its human history. The short time

(1) January, 1939.

that Ireland has been occupied by man allows us to discount the idea of any radically new type appearing but we may expect slight changes in the very oldest inhabitants.

The facts at our disposal are lamentably small for Ireland as a whole, and especially so for Northern Ireland. Skeletal evidence of early types is very scanty and many of the skulls available cannot be accurately dated. Unfortunately the pioneer of modern anthropological field work, Dr. J. Beddoe, neglected Ulster; he says modestly in his book *The Races of Britain* "I know very little of Ulster," while he describes types from the South and West of Ireland.

The people of Ireland can only be studied in conjunction with the peoples of Western Europe. In the Upper Palaeolithic Period Europe was inhabited by peoples of the modern type already diversified into three or more different varieties. None of these could have reached Ireland for a long time after the ice had retreated as the country and climate were not attractive to a people who depended for their food supply entirely on hunting and gathering. However, some of these Palaeolithic hunters eventually moved Northwards and somewhere around 4,000 B.C. reached Northern Ireland. The traces of their occupation are found in the raised beaches at Larne, Cushendall, etc., and possibly in the Bann Estuary region. They also occupied sites on the west coast of Scotland, so that the traditional connections between Northern Ireland and Scotland, generally attributed to the Christian Period or to the Plantation, go right back to these first settlers around 4,000 B.C.

As people they were generally short to medium in stature, with long, narrow, high-vaulted skulls, and where they occur in the modern population they have generally brown or light brown hair and light-coloured blue or grey eyes. To-day the high-vaulted skull with its slight median ridge tends to be rather lower and more rounded in outline but it remains quite distinctive and easy to distinguish from the skulls of the later invaders, even when these invaders were originally part of the same parent stock. These upper Palaeolithic people are the true Irishmen and, despite their great antiquity, they do form quite an important type in the present population.

Evidence on the physical type of these people during Raised Beach Times, in Ireland, is admittedly scarce. The best authenticated specimen is a skull in the Queen's University, Belfast, found in 1922 and labelled as follows:—"Human Skull found 6 feet 6 inches below street level and three feet below bed of marine shells in estuarine clay at Castle Market, Belfast, Oct., 1922. The skull is that of an adult male and is of the river-bed type."

It is a long and very narrow skull, C.I.70, with a basilar height which is equal to the maximum parietal breadth. There is a slight ridging along the median sagittal plane.

Other raised beach skulls of the same general type and possibly of the same date as the Belfast skull have been found at Whitepark Bay, Ringabella Co. Cork, and at Balbriggan. The dating of these skulls is difficult and not yet definitely established but in type they represent the early pre-Neolithic inhabitants of Ireland.

It is customary to-day to regard Ireland as the furthest west-ward extension of Europe—hence the term "Ireland the Outpost." But in the Neolithic period Ireland was an island mid-way on the great trading route which connected, along the Atlantic seaboard, the Mediterranean (Spain and the

Garonne estuary) with Scandinavia. Neolithic civilisation, with completely new ideas of life and outlook, with a knowledge of agriculture and domestic animals, penetrated northwards along this route and so about 2,300 B.C. reached Ireland. Again one of the main routes of entry was the "short sea passage" across the North Channel.

The settlers, who brought these new ideas, were people of the Mediterranean or Iberian race. They were derived from the same Upper Palaeolithic racial group which had already reached Ireland long before. But they were specialised to meet different climatic and living conditions in the lands bordering on the Mediterranean Sea, and chiefly those bordering on the Western Mediterranean basin. They have dolichocephalic heads, with a long, absolute length and generally some projection of the occipital region. Their heads are slightly broader and lower than the original inhabitants of Ireland and their foreheads and nasal apertures narrower.

In Ireland, the early adoption of the practice of cremation by these people has destroyed most of the skeletal evidence. Evidence of their occupation of the country is abundant in the great megalithic stone monuments, very common in Ulster, and some types of which are peculiar to it. Grattan, in 1855, reported on a burial at Ballynahatty, Co. Down, near the Giant's Ring and described two skulls from it. One of these is now in the Queen's University, Belfast. It conforms closely to the generalised description of Neolithic crania already given and has a C.I. of 75. This is slightly broader than the epi-palaeolithic skulls whose C.I. rarely exceeds 73. The average cephalic index of all the skulls from the megaliths is 75.2.

There is evidence that the people who brought in the practice of megalithic burial were not all of one race on their arrival in this country. It may well be, however, that they were soon followed by a people of a different racial type with much the same customs. This second Neolithic type was a people from the Eastern Mediterranean who have been variously named the Prospectatores or the Ancient Mariners (or the Maritime Armenoids). Little is known of these people in the archaeological record of Ireland. They were a very tall people with a stature approaching 6 feet. They had broad heads, C.I. 80-82 with flattened occiputs, orthognathous faces, strong jaw bones and facial features, and upright or vertical foreheads. The brachycephaly and tall stature of these people are probably due to an Eastern European mixture. They formed an element in the Neolithic migration from the Mediterranean and, as such, maybe arrived in Ireland with the short, dark Mediterraneans.

These first Neolithic people had not long been settled in Ireland when a disturbance in Central Europe threw another people against the eastern coastline of England and Scotland. These were very different, both in physical type and culture, from the races on the Atlantic seaboard. This new invasion was by the Beaker people, so called from their most characteristic pottery vessel, and the date of their arrival is generally given as 1,800 B.C. They were better farmers than the Neolithic peoples and lived more on a diet of grain. In their skulls the teeth are generally badly worn by the action of grit which mixed with the flour in the primitive type of mill used. They buried their dead in short, coffin-like, stone cists in a contracted position. They had several landing places on the east coast of England and Scotland, from Kent to Aberdeenshire, and from these centres penetrated inland, coming into contact and mixing with the peoples on the west of Great Britain. They crossed to Ireland from Southern Scotland and Northern England, again using the shortest sea route, but some seem

to have come across from North Wales. As yet, traces of their culture have not been found widely in Ireland. Herring reported on some beakers found in North Co. Derry only last year and some have been found more recently in Tyrone. In type the Beaker folk are a very tall race, stature often 6 feet, with short, broad skulls, a vertical forehead, and flattened occiputs. They have orthognathous, fairly broad faces and the limb bones are generally slender, but strong.

Formerly it was supposed that the Beaker folk did not come to Ireland in any great numbers. But now we know of 12 skulls from short cist burials, all of which are of this short, broad type. As the burial cists are not nearly so conspicuous as the megalithic tombs, it is only to be expected that they should be overlooked during previous excavations and similarly it is to be expected that more will be brought to light with the advance of scientific archaeological excavation. So we must accept the fact that the Beaker people are a sufficiently important element in our racial history to leave a mark on the modern population. Where they are found they are generally fair in colour, the hair varying from dark blonde to light brown and the eye grey or blue.

Ireland was free from invasion during most of the succeeding Bronze Age and in this long period of peaceful development she attained a very important place in European culture. This flourish of Irish culture rested on an abundant supply of copper and a steady gold supply. Gold objects of Irish workmanship, attesting to the sphere of influence of Irish trade, have been found on the Continent in deposits of this period, in places as widely separated as Spain and Denmark.

Towards the close of the Bronze Age, about 900 B.C., a second force reached Ireland from the mainland of Europe. Originating in the same east-central European melting pot as the Beaker people, though composed of different elements, these folk were, at the time of their arrival in Ireland, slightly lower in the cultural scale than the inhabitants. However, by virtue of their superiority in armaments, they quickly subdued the country. Their new weapon was the bronze leaf-shaped sword. We do not know much about this people; they brought with them no tales of their former homeland and remained in Ireland a military and governing caste, having little contact with the mass of the inhabitants.

The greater part of the invaders seem to have been short people, or at any rate a race of medium stature. But their total was small in relation to the general population. In addition to being short in stature, they were broad-headed with low, very rounded skulls, narrow, slightly bulging foreheads and short, broad faces.

When they arrived in Ireland they were probably not all of one racial type. On analogy with the Continent, these people were most likely accompanied by some people of Nordic or proto-Nordic stock.

The Nordic race is centred in the South Baltic region where they had moved early from some region, not yet accurately defined, in South-east Russia. To the south is a vast region which, at this time, was a great mixing area for racial types and which, under pressure from the east, was continually influencing the more settled Mediterranean region. The tall, blonde Nordics appear in this region as military overlords, and as such moved westwards in the late Bronze Age and early Iron Age invasions and so arrived in Ireland. The greatest movements from this Baltic or Scandinavian zone did not take place until the 5th century A.D. and this "wanderings of the peoples" did not affect Ireland.

The characteristics of the Nordic race, are tall stature, muscular build, strong bones, a long or medium long skull, well-filled. The face is very orthognathous with a strong chin, narrow nasal aperture and an upright forehead. There is often some spacing of the upper incisor teeth. These features are associated with blonde hair, blue eyes and a skin which has no brown pigment.

After these people had arrived in Ireland there was a long period with no major invasion. Recovery during this period was slow but finally Ireland again reached a high place in the European cultural world. This flowering was in the Early Christian period and again Irish workmanship was prized over all Europe. During this period England was subject to the Roman invasion, and after the Romans had withdrawn the Anglo-Saxon tribes from North Germany attacked her eastern shores. But Ireland was spared both these shocks and preserved her knowledge and religion intact, and now she sent her scholars and missionaries to England and the Continent, to bring enlightenment to the barbarian tribes who had succeeded the Roman Empire in N.W. Europe.

In the eighth century A.D. there was a fresh upheaval in the Scandinavian area and the Norse raiders, this time by virtue of their greater sailing range, reached Ireland by the sea routes around the north coast of Scotland. From their bases in the Scottish Hebrides and the Isle of Man they harried the north and east coasts of Ireland. They were traders, as well as pirates, and some of them settled down among the native population. The Nordic people who entered at the end of the Bronze Age had several centuries of residence behind them and are, possibly, ethnically more important than these later peoples.

With the arrival of the Norsemen the racial mixture of Ireland is complete. So far as is known the later historical invasions of the Anglo-Normans and the Plantation of Ulster by English and chiefly by Scotch settlers introduced no new racial types. However it is difficult to be dogmatic on this point at the present moment, but if the people in the districts known to be planted by the English, or the Scotch, do differ racially from the native Irish, then the present survey of physical types will record such differences as these areas are studied.

As the main body of the Scotch settlers came from the adjacent coastlands of Scotland—from Argyllshire, Ayr and Galloway, as family names tend to show—and as these areas were in the same cultural zone as Northern Ireland and influenced largely by the same movement of peoples, then it is possible that the people who planted Ulster from Scotland were of the same racial types as the Irish people they displaced.

Ireland has, therefore, during the long period when she was a home for man, a succession of differing races impinging on her coasts. The present population, as a result of this racial mixture, is very diverse. Such diversity of type has been recognised in the first written records of the country and has been attributed, rightly, to a series of invasions. These records, the history in the annals, cannot be earlier than the second century A.D. The element of movement in these early times has undoubtedly been exaggerated, for it is unlikely that pre-historic movements of peoples, especially when sea crossings were involved, were wholesale mass migrations. The native stocks must therefore have retained their importance during, and despite, all the additions to the population in the pre-historic and early historic time. On this ground there is good reason for stating that the population of Ireland is possibly epipalaeolithic (pre-Neolithic) in race type. At any rate this epipalaeolithic stratum in the population is much more important than is generally realised.

EXCAVATIONS AT INISHEE.

By O. DAVIES.

The island of Inishee lies in Lough Macnean Lower, opposite a point on the north shore and beside another on the south.⁽¹⁾ This lake is less studded with islands than the Upper. There are two small crannogs of late medieval type, one near the south shore opposite Inishee⁽²⁾, the other in the recess of Belcoo Bay⁽³⁾ close to Major Nixon's house. On both I picked up animal-bones, on the second two leaden musket-bullets. I was anxious to test an island in Fermanagh, and chose Inishee because of its appearance and its name. Though the whole island was obviously not artificial, the wide flats on all sides being an old shore, the steep central mound seemed of human construction (see pl. I 4), and I hoped to find a stratified habitation-series. The name (? = Island of Fairies) also suggested former occupation. O'Donovan⁽⁴⁾ identifies Inishee with Inis-ochta in Loch Mac-nen, whither a prisoner was taken by the O'Rourkes, on the ground that according to an old MS. it was the residence of King Aodh, and that the modern name is a corruption of Inis Aodha. As however the excavations yielded few medieval traces, I would reject this theory, and equate Inis-ochta with Port Island⁽⁵⁾ in Lough Macnean Upper, on which are the ruins of an interesting circular keep which might well date from the fifteenth century.

Permission to excavate was kindly granted by Lord Enniskillen. A grant was made by the Archaeological Section and from the government unemployment fund. The work was carried out in April, 1939. Finds have been deposited in Belfast Museum.

A test was made on the flats about sixty feet north-west of the mound⁽⁶⁾. At a few inches depth were stones and a modern sherd. The stones seemed to form a cobbling, and were probably laid down when the neighbouring cottage was in use. Below them was boulder-clay. Its level surface must be due to erosion by the lake, which only recently has sunk to its present height. There was modern pottery and glass in the clay at a few inches depth.

Round the present shore were found a few objects, modern sherds, teeth of sheep and ox, on the south and south-east a good deal of waterworn iron-slag (see below), on the north a chipped flint knife (fig. 3, inv. no. 1)⁽⁷⁾. The shore is formed of stones with some sand and gravel. A shoal extends eastward from the island into the lake.

Beneath the west side of the mound are the ruins of a cottage⁽⁸⁾, which was inhabited within living memory. It seems that at that time parts of

(1) O.S. Fermanagh 25 12 5. See plate I 3.

(2) O.S. Fermanagh 25 13 2. Plate I 1.

(3) O.S. Fermanagh 25 11. 3. Plate I 2.

(4) Ad A.F.M. 1499.

(5) Locally called Green Island. O.S. Cavan 1 8 4.

(6) This part of the island was not planned.

(7) Yellow-brown flint, water-worn so that much of the chipping is difficult to distinguish, lower side flake-surface, upper side two, with edges chipped. Average thickness along midrib .25 ins.

(8) The position is roughly indicated on the plan, without the walls being accurately included.

the island were cultivated, and that this has disturbed the stratification of the top of the mound. The low stone wall, about one foot high, on the north side of the mound, is probably of the cottage-period.

A pit was dug at the north-eastern base of the mound. Below six inches we found dark gravel and sand mixed with a great deal of rubbish (inv. no. 104). The numerous animal-bones⁽⁹⁾ are very rotten and badly smashed; a few are

BONE POINTS :

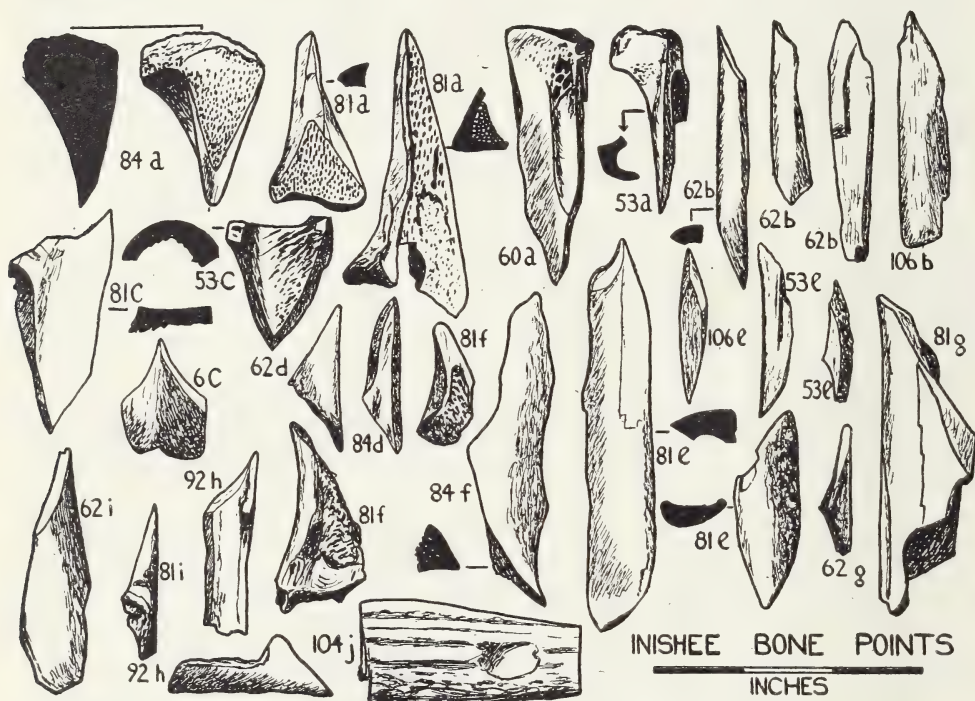


Fig. 2.

burnt. Only a small proportion are identifiable, mainly teeth of pig and deer. The teeth are not stained, and few of the bones have been rolled. Not more than four could be considered shaped (see below and fig. 2). There were in addition two iron clamps and a small iron bar⁽¹⁰⁾, two scraps of iron slag (see below), a little charcoal, and a sherd of hard brown medieval ware .22 ins. thick. Four flints were found, a rough chip from a pebble, two burnt flakes, one of them apparently a broken hollow scraper, and a broken round-nosed scraper worked

- (9) The statistics are : 354 bone-chips, almost all unidentifiable,
25 chips of burnt bone,
18 identified bones,
4 worked bones.

The identified bones are 10 of pig, 7 of deer, 4 of sheep and 1 of ox.

(10) One clamp is $\frac{1}{4}$ in. wide and bent round at both ends so that its back is $1\frac{1}{4}$ ins. long, and the two points $\frac{3}{4}$ and $\frac{1}{2}$ in. It does not look ancient. The second clamp is smashed; the back is $1\frac{1}{4}$ ins. long, one point is broken. The bar is a thin flat piece $2\frac{1}{2}$ ins. long, slightly crooked at one end, but not bent or pointed like a clamp.

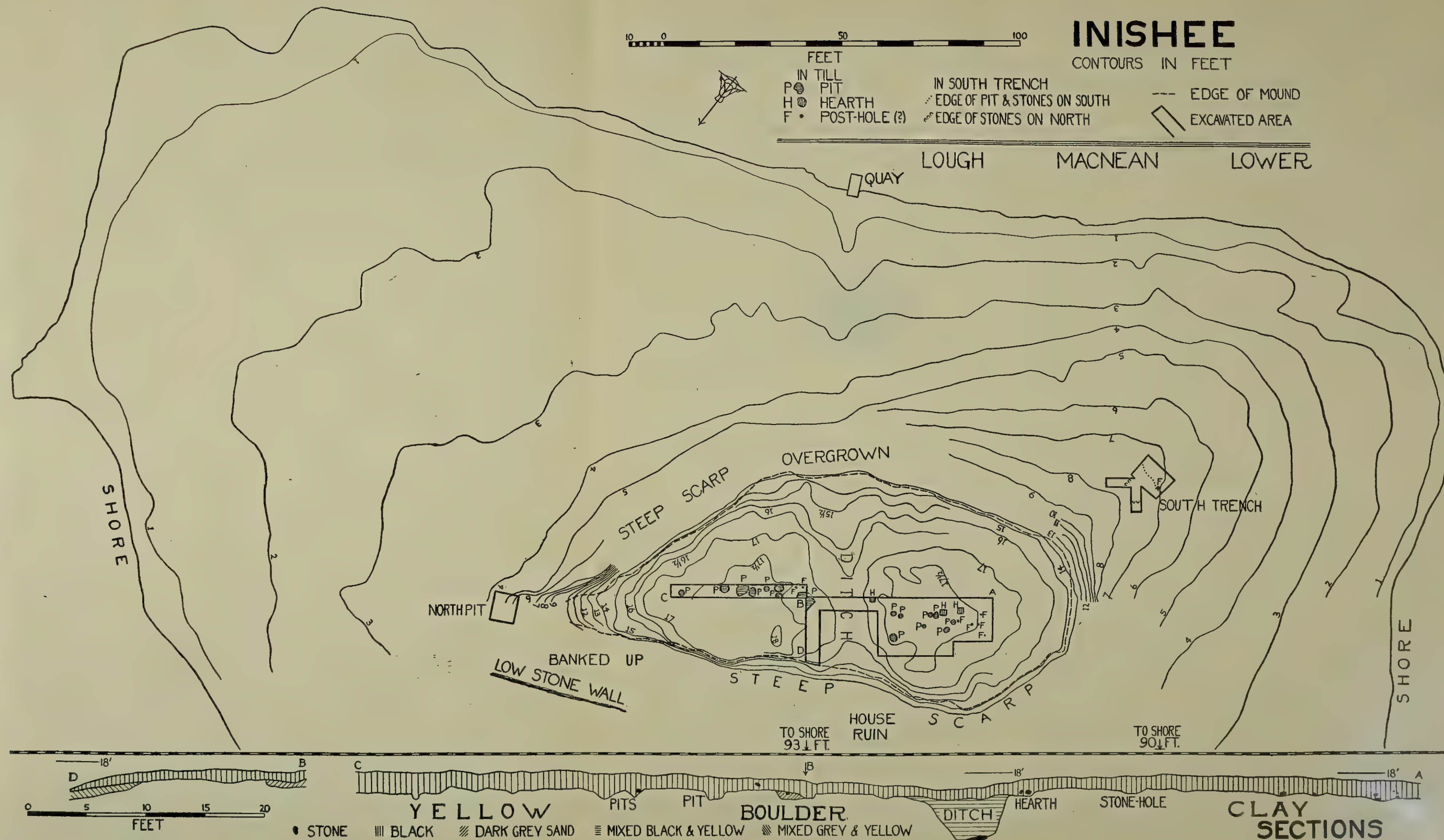


Fig. 1.
Lack of time and above all the thick undergrowth on parts of the island made it impossible to complete the contour-plan; there are blanks especially round the slopes of the mound. To understand the plan, it is necessary to observe the numbers of the contour-lines; by this means, a fair idea of the shape of the island may be obtained. Heights are given in feet above water-level on 13/4/39.

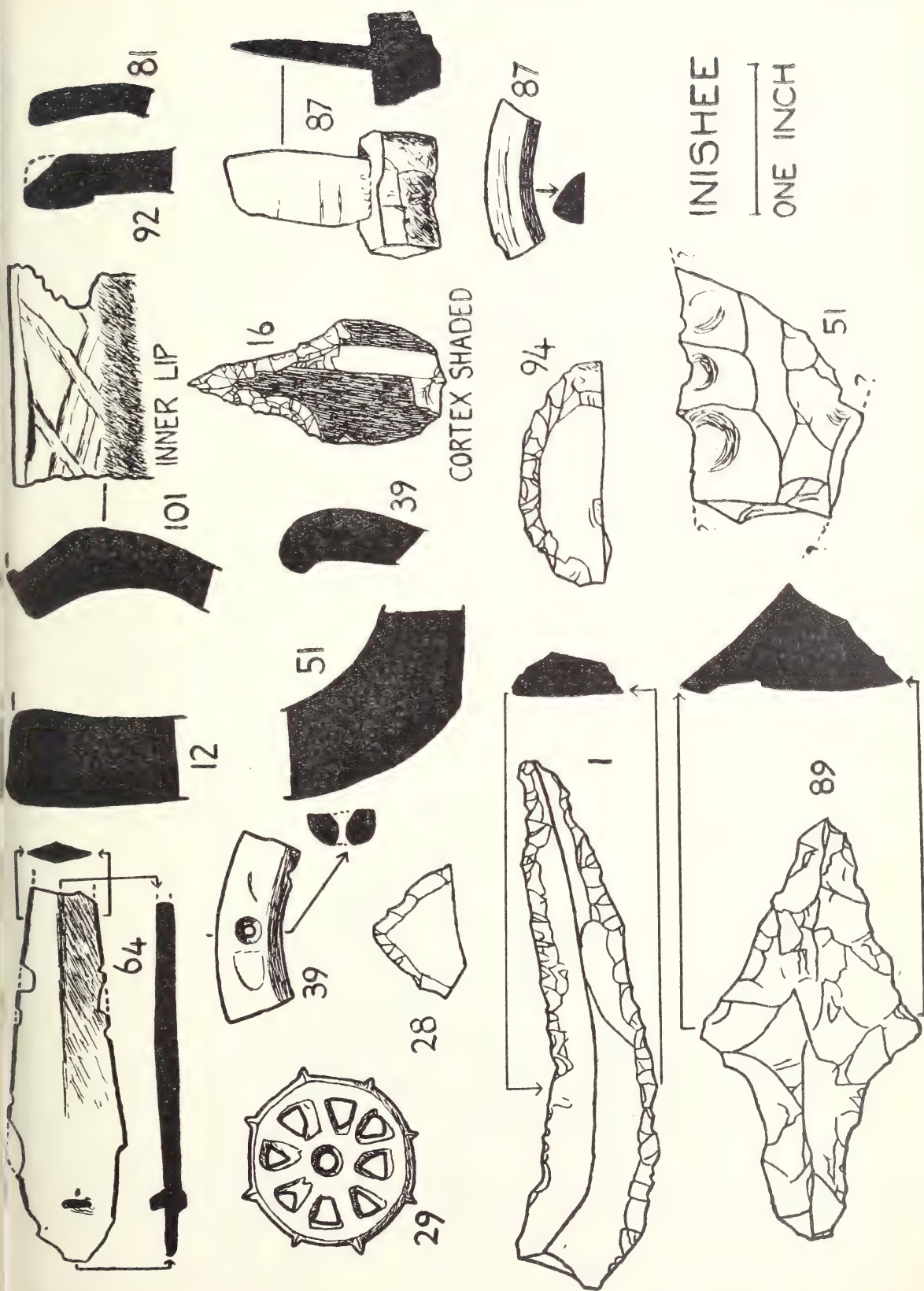


Fig. 3.

fairly steeply round the edge, with flake-surface on the under-side and maximum thickness of .28 ins. This material did not seem stratified and cannot be proved homogeneous. It was of little interest in comparison with the finds at the other end of the mound, and so this excavation was discontinued.

IRON OBJECTS :

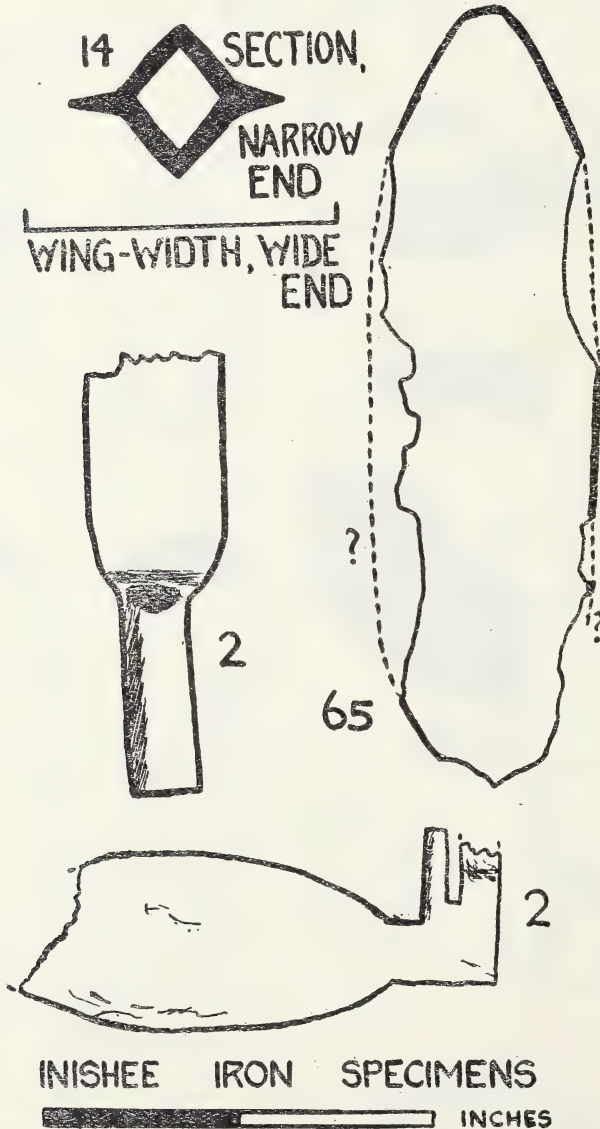


Fig 4.

A pit was dug on the south edge of the mound (for stratification, see plate II 1). The subsoil was found to consist of dark gravel, which near the base of the mound

was shallow and earthy, but purer from about six foot out, the transition to the clayey till being sharp. The topmost foot of gravel was dark, below that for about nine inches (Ht. 5-7') it was yellow-brown. The gravel contained coarse sand and fragments of limestone, chert and quartzite, and resembled a river-gravel derived from the erosion of a moraine. In all parts it yielded worked and unworked bones and other human refuse, but very little charcoal.

On the south of the trench the boulder-clay was reached at Ht. 5-7-5-5'. On its surface were a few large stones, insufficient to be described as a pavement. On the north however, though the upper layers of gravel were continuous, a deep pit had been excavated in the clay, whose base we had failed to reach when we were checked by the influx of water at Ht. 1-0'. At a depth of 1 ft. 9 ins. to 2 ft. 7 ins. (Ht. 5-7-48') were very large stones, more or less level with the surface of the boulder-clay on the south, but not covering the whole pit on north and west. Below the stones bands of light and dark gravel sloped steeply from the wall northward into the pit. In the dark bands was some charcoal. All through were numerous bones of large animals, sharp-fractured in contrast to the rounded edges of the specimens from the upper levels of the trench (see below); a few teeth of pig and bones of deer were recognised, but there were no specimens which could be regarded as artificially shaped. There were also a few scraps of vesicular slag, and two pieces probably of millstones. It is possible that the pit was for rubbish or for habitation. The bones seem to have been dropped in situ; the bands of lighter gravel may have been put down for cleanliness, and thus would have banked up against the pit-walls.

It is doubtful whether Inishee naturally contained extensive gravel-deposits, as wherever reached the till was found to be hard boulder-clay. The presence of bones and other refuse shews that this gravel had been disturbed, and probably deposited by man. There used to be gravel-beds on the north shore of the lake opposite Inishee. It is however less easy to understand why loads of gravel should be transported. Whatever the purpose of the pit, the bones in it differ markedly from those above. The large stones may represent a flooring, the habitation spreading over the clay-surface outside the pit. There may have been a higher habitation layer resting on sand at Ht. 6-1'. The surface-gravel may have supported a further stratum now eroded.

For whatever reason the gravel reached Inishee, whether as flooring for superposed settlements or to provide a small well-drained patch for potatoes, it seems clear that most of its contents were derived from its original site. In the lowest level above the large stones (inv. no. 106, Ht. 5-9-5-5') many of the bones were fragmentary and rotten, few had been rolled or stained; they thus in general resembled those from the pit. But at higher levels their edges were normally blunt, as if they had been slightly rolled; the surfaces were sometimes decayed and sometimes polished; and many of the teeth had reddish stains, as if they had been in long contact with ferruginous circulating waters. It is difficult to conceive how such conditions can have existed on the island; so I would suggest that gravel and bones were transported from the mainland, where they had lain exposed to water-movement perhaps near the mouth of a stream.

It would seem improbable under these circumstances that valuable conclusions can be drawn from the stratification of the trench; the transported gravel is likely to preserve a rough stratification either in reverse order or horizontally. Of the latter, no evidence was discovered; and in view of the great

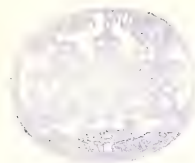
importance of the finds, it has been thought desirable to set out the evidence in detail before drawing conclusions⁽¹¹⁾.

Inv. no.	Height.	Bone chips.	Worked bones.	Deer.	Sheep.	Horse.	Pig.	Ox.	Iron slag.	Other finds.
53	7.5-7.0	202	33	8	3	—	3	—	2	3 chert chips. Iron nail 2½" long of square section. Loop of iron wire. 2 iron nails. Flint chip. Clay pipe. 2 iron nails. Iron strip. Sherd. Modern glazed sherd. Sherd.
62	7.0-6.8	544	61	18	7	—	10	10	4	
81	6.8-6.5	482 + 4 burnt	59	23	6	—	8	2	10	
84	6.5-6.3	301 + 3 burnt	27	15	5	—	12	6	15	
92	6.3-5.9	444 + 21 burnt	24	10	6	1	15	1	Much. Fused clay from furnace.	Large burnt stones. Much charcoal. 10 iron scraps. 2 ancient iron nails. Chert flake. Flint scraper. 6 sherds. Stone bracelet and amulet (inv. no. 87). Iron nail and scrap. Sherd. Chert knife. Copper strips. Little charcoal.
106	5.9-5.5	370 + 29 burnt	8	4	—	—	18	—	Much.	

The sherds found in this trench are mainly of black hard ware about .25 in. thick; one piece, yellowish and with grass-marks, may have been part of a flat base. There are two rims (fig. 3). Inv. no. 81 is black outside and red-brown inside. Inv. no. 92 is broken; the clay has been smoothed over on to the outside wall to give a wavy encrusted frieze below the rim. All the sherds seem in texture to be medieval, except for a piece, inv. no. 84, .5 in. thick, which from its softness and poor baking looks like a prehistoric ware, perhaps late bronze-age.

Under inv. no. 87 are included (see fig. 3) part of a small plano-convex bracelet of sandstone, of a type in use in the early Christian period; and what

(11) In this table the heights are given roughly, assuming that the edge of the trench is at Ht. 7.5'. Of the bones, teeth alone were identified; a few other bones could probably be. In the table of worked bones, only those which may with reasonable certainty be so described are included; some at least of the bone chips were probably also used as tools. For discussion of the slag and other finds see below.



[B.N.H.P.S. Prcc., 1938-1939.]



Plate I

1. Crannog near south shore of Lower Lough Macnean
2. Nixon's Crannog, Lower Lough Macnean. Inishee in distance.
3. Inishee from west.
4. Mound on Inishee from south-east.



Plate II.

1. Stratification of south trench. The pegs mark the black earth, the stone foundation, and a lower black layer.

2-4. Adjacent hearths sunk into till at the south-west end of the top of the mound. 2 is the one nearer point A ; 3 and 4 are two views of the more northerly one, close to two pits in till. It will be seen that one of the stones forming this hearth is a broken millstone.

appears to be a stone amulet. The latter was made from a piece of local stone, containing a band of chert and a band of fine-grained sandstone. The chert base is flat on top and measures .7 x .6 in. The sandstone has been ground to a narrow pillar, measuring .9 in. high and .5 x .1 in. at base; it has a slight neck at the junction with the chert. I have shewn this object to Dr. Evans and Mr. Hartley; both agree that it cannot be of natural origin. Its purpose however is uncertain. it is too small and fragile for a key, so it may be labelled an amulet in default of other evidence.

The flint-scraper listed under inv. no. 92 is a small button-scraper, flat and perhaps broken at the base, circular and finely chipped round two sides, of about .7 in. diameter. The under-side is a flake-surface. The maximum thickness, along the flaked edge, is .23 in.

Under inv. no. 106 are mentioned a chert knife and fragments of thin copper foil. The former is of triangular section, finely chipped along one edge of the upper side. The latter (inv. no. 102) are snippets about .01 in. thick, almost certainly cut with scissors or similar tool, sometimes unevenly as if torn. One piece is a strip .3 in. wide, with two rivet-holes 1.2 in. apart, set irregularly. None of this material looks ancient; and the fact that it was found at the base of the gravel suggests that the stratification has been reversed. This is borne out by the comparatively rarity of worked bones in depth.

The bones have been examined by Professor Walmsley as well as by myself. There are a few specimens of ox and of bird-bones, but the great majority are deer, and there are pieces also of sawn antler. Most of them are natural splinters fractured by violence. Some of these have been shaped to points by rubbing, probably on fine-grained stones. There are also slight thumb-grips, and in many cases the sharp edges have been rounded to prevent damage to the user's hand. Some pieces have been sawn, especially the ends of long bones (type a), whose hard surfaces and cancellous tissues could not have been reduced to flat planes by rolling or rubbing. Most of the worked bones come from the south trench (all inv. numbers listed above); a very few were found in the north pit (inv. no. 104) and on the top of the mound (other inv. nos.).

While it is difficult to specify uses or types, it is unlikely that all the bones had the same purpose, and the following classification is provisionally presented (see fig. 2):

a. The end of a long bone, sawn lengthways so as to give a blunted point against the flattened edge of the bone, and a grip at the knobbly end. Most specimens are about two inches long, a few up to three inches. One piece of similar shape is made from a jaw, one from a rib.

b. Long points, up to four inches in length, narrow and with roughly parallel sides, of bodkin-shape. Most are fragments of long bones, a few are rib and probably also split sections of antler.

c. Points shaped like a broad triangle, roughly equilateral, mostly not more than one inch long. Some are flat, made from shoulder-blades or similar bones; others are curved, and are perhaps pieces of long bones.

d. Splinters shaped as flattened triangles, with very obtuse apex and two sharp points. This type is uncommon, and most of the specimens are about $1\frac{1}{2}$ inches long. They are made of any small piece of flat bone.

e. Double-pointed bones with curved sides, $1\frac{1}{2}$ -4 inches long, usually very even and quite narrow. Some are splinters of long bone, others curved chips of rib.

f. Curved points resembling (a), save that the handle is formed by the curve of the bone rather than by a knobbly end. Some pieces retain a little internal cancellous structure. This class is a miscellaneous assortment of pieces varying from $1\frac{1}{4}$ to $3\frac{1}{2}$ inches long.

g. Pieces approximately half-bones, usually heavy and solid. The point is on the narrow edge of the bone, and the grip has two walls. They are from two to four inches long.

h. Bones of triangular shape with a barb on one side, usually one or two inches long. This type is rare, and in some examples the barb may be due to subsequent fracture.

i. Bones shaped like elongated isosceles triangles, usually $1\frac{1}{2}$ - $2\frac{1}{2}$ inches long, and with little lateral curve. Some examples are pieces of the edge of rib-bones.

j. Three antler-points, $1\frac{1}{2}$ and 2 inches long, sawn at the base. Also a section of antler, split longitudinally to $1-1\frac{1}{4}$ ins. wide, sawn at both ends, at one rather jaggedly. In one place the surface is flattened by polishing.

Though modern and apparently ancient objects occurred at all levels in this trench, iron-slag became commoner in depth, whereas worked bones decreased. Assuming a reversed stratification, the bones are probably earlier than the iron-working. Local smelting is unlikely to have been carried out later than the middle ages, and may well be contemporary with the plano-convex bracelet. To the same or an earlier period probably belong the bone-points. There is no intrinsic reason why such primitive tools should not have been in use in Ireland in the middle ages. The types are rude, almost makeshift; they do not remind one of the fine bone-work of the mesolithic period. It is not impossible that mesolithic traditions may have survived among isolated and perhaps fugitive fishing communities. But it would be a mistake to attempt to date their settlements too high.

The steeply scarped mound in the centre of the island appeared at first sight to have been artificially shaped; but it is not impossible that long-continued erosion of its base by lake-waters about eight feet higher than they are to-day would have produced almost precipitous slopes round a rather steep glacial knoll. The lake-level was lowered by the Erne drainage-scheme; and in the middle ages a damp climate and inattention to lake-outlets caused serious flooding in many districts. A rise of some eight feet is however hard to justify; and so perhaps the mound was artificially scarped for protection.

The top of the mound has probably been levelled. The mixed grey and yellow clay of the north edge (section BD) appears to be the remains of original subsoil. The stratification has been completely disturbed, probably by modern cultivation; modern sherds were found on till, and in the black humus were flecks of yellow, where the spade had in places touched the boulder-clay. Hearths and pits had been however sunk into till without reference to subsoil; nor is the flat top of the mound a natural shape. We may therefore conclude that the mound has been artificially levelled.

The surface of the till was not only uneven owing to the removal of projecting boulders, but there were also found in it a number of pits 6-12 inches deep (see plan, also a few which are plotted on the section), filled with earth normally rather blacker than the humus, which often contained a great deal of bone and

sometimes charcoal⁽¹²⁾. A few pits contained light grey sand. Towards the north end of the mound, where pits were numerous, some were quite large and up to 1 ft. 6 ins. deep; in the south part they were seldom sunk more than six inches below the surface of the till. A few, three to six inches across, seemed sufficiently regular to be regarded as post-holes (see plan); but they formed no line or other figure.

Three of the pits were stone-lined hearths, containing black earth, charcoal, burnt bone and other refuse⁽¹³⁾. Into one was set a half-millstone (plate II 3 and 4, inv. no. 85), not quite at the back of the hollow, there being a penumbra of grey earth behind it. The stone is 1 ft. 5 ins. across and $4\frac{1}{4}$ ins. thick at the centre. The under-side is fairly flat, broken at the edges; the upper is roughly convex. A central depression two inches across has been bored from each face; but they do not quite meet.

Across the centre of the mound is a ditch four feet deep, filled with mixed black and yellow earth; this contained at all levels much bone and charcoal⁽¹⁴⁾, occasional scraps of fused clay, flakes of flint and chert⁽¹⁵⁾, and near the surface a bronze wheel-ornament (inv. no. 29, see below and fig. 3). The ditch seemed to have been intentionally filled, probably for modern cultivation; that this filling was preparatory to tilling the top of the mound is suggested by the fact that the mixed clay contained no glazed sherds, which are likely to have been introduced on to the site in the course of cultivation. If the mound had at some period been fortified by being scarped, it is easy to conjecture that that ditch was an additional defence, cutting off the southern end, where the hearths shew was the main settlement, from the easiest ascent by the gentle slope on the north-east. Much refuse, it is true, was found on the northern part of the mound; but the principal datable objects came from south of the ditch.

The absence of stratification on the mound makes it necessary to group objects according to their probable age. There was much modern refuse, sherds of glazed pottery, pieces of old wine bottles greenish-yellow and rather opaque, probably eighteenth or early nineteenth century. Some of the iron scraps may also belong to this date; but in the absence of certain criteria they have been grouped as medieval. We also found many flakes of flint⁽¹⁶⁾ and chert⁽¹⁷⁾, occasionally burnt. Some of the flint consists of moraine pebbles which could have been obtained locally; other pieces were apparently imported. The local chert was also used for tools, though it does not take as fine an edge as flint. It is significant that chert was little used at the neighbouring banded cairn of Aghanaglack; either Inishee dates from a different period, when communications

(12) Inv. no. 36, a paved pit, containing ash and oak charcoal. Inv. no. 66, containing hazel charcoal and a poor flint flake. Inv. no. 83, hazel and oak charcoal, and chips of chert and flint. Inv. nos. 89 and 94, see below and fig. 3.

(13) Inv. no. 11, pl. II 2, the hearth nearest point A, containing oak, hazel and willow charcoal. Inv. no. 30, the hearth on the south edge of the ditch, hazel charcoal and a coarse sherd. Inv. no. 85, the central hearth marked, near a series of pits, with oak and ash charcoal and a rough sherd.

(14) Charcoal of hazel, oak and ash from the base of the ditch. The specimens at higher levels, being unstratified, have not been examined.

(15) Flint chip, inv. no. 31; flint flake, inv. no. 50; chert flakes, inv. nos. 32 50.

(16) Flint flakes, inv. nos. 9 15 23 50 55 73 93 109. Flint chips, inv. nos. 7 8 33 34 56 70. Burnt flints, inv. nos. 7 15 63. Inv. no. 16 is a flake .2-.25 in. thick and .7 in. across with parallel sides. It seems broken in length, and is heavily burnt. There seem to be signs of chipping along the edges, so it may be the butt of a knife or similar tool. Inv. no. 15, found a burnt flint which may have been a rough scraper. Inv. no. 95 is a burnt square gun-flint, measuring .7 x .6 in.

(17) Chert flakes, inv. nos. 3 9 15 16 17 21 50 55 58 82 90 107.

with the flint-bearing regions were less active; or else its people enjoyed a lower standard of culture and lower purchasing power.

I have not thought it wise to class as prehistoric anything but one metal object and a number of flints. The former (inv. no. 64, fig. 3) is a small broken copper blade⁽¹⁸⁾. The exact form of the butt is uncertain. On each face of it is a small knobbly projection, to secure a handle; these projections seem to be imitated from the more usual rivet. The blade has a small midrib, and is otherwise undecorated. I have been unable to find parallels to this knife either in standard works of reference or in the museums of Belfast and Dublin. I think, however, that it is unlikely to be mediæval; and perhaps a comparison may be made with a rather vague notice of a find near Armagh⁽¹⁹⁾ of daggers with a small rib-like projection on each side. They were associated with certain objects in the Craig Collection now in Armagh Museum, which can be assigned to the late bronze-age.

Three flints appear to have been used as hollow scrapers. One (inv. no. 39) is a small thin flake, perhaps chipped to a rather angular hollow. Another (inv. no. 72) is a thin flake of poor flint, roughly chipped to a hollow .8 in. wide and .2 in. deep. The third (inv. no. 23) is a thin burnt flake, apparently hollowed on one edge. We do not know the purpose of these tools; but the numbers found at Island MacHugh shew that they are characteristic of the prehistoric island-dwellers, so it is not surprising to find examples also at Inishee.

In addition to the knife found on the shore (inv. no. 1, fig. 3, see above), we may perhaps class inv. no. 94 (fig. 3) as a knife. It is probably broken. Both sides are flake-surfaces, about .2 in. apart at the nose and converging near the butt. The flaking round the edge is steep.

Inv. no. 16 (fig. 3) is a finely chipped flint borer. The under-side is a flake-surface, the upper is partly composed of rounded pebble-cortex. The tool has been chipped to a fine point. Inv. no. 51 (fig. 3) is a lump of flint of maximum thickness .5 in. The under-side is formed of flat rolled cortex except near the edges, the upper has been deeply and coarsely flaked from the outside. The object is probably broken, and may have been a rough pointed spear or similar tool. Inv. no. 28 is a small piece of red flint .2 in. thick. Both sides are flake-surfaces, and it has been steeply chipped round the edge, perhaps to form the blunt point of a spear or arrow. The butt is probably broken. Inv. nos. 45 and 48 appear to be similar tools; they are fairly thin, and measure about .7 x .6 in. Two edges of each have been chipped, one convex, the other slightly concave; in each example the third edge seems broken. They might be rough hollow-based arrow-heads; but I consider that they are rather to be classed as scrapers.

There are two tools of chert. One is a broken flake of trapezoidal section, finely chipped along one blade to form a knife (inv. no. 16). The other is the remarkable spearhead inv. no. 89 (fig. 3). It is made of inferior banded chert. The under-side is approximately flat, but not formed by a single flake-surface. The upper-side has a marked ridge, as much as .4 in. high close to the point and butt. The chipping has been by large flakes, with a certain amount of fracture.

(18) The metal contains cu 89.66%, pb 5.24%, sb 4.08%, sn a little, fc 3.07% (in the oxydised portion examined, perhaps derived from water), no ag bi zn ni co as. The metal is much oxydised near the blades, but there is a yellow core in the midrib.

(19) *Newry Telegraph* (5/9/1837).

Of the pottery, sherds 12 and 51 (fig. 3) might well belong to the same vessel. The ware is hard and dark-coloured, reddish in places; the surface is not very even. The thickness of the pot is not characteristic of the middle ages, when better baking enabled thinner vessels to be manufactured. The shape is suggestive of souterrain pottery, but may also be paralleled in the late bronze-age ware found at Loughash Giant's Grave⁽²⁰⁾; and to this period I would assign the pot. Most of the other sherds found on the mound (see fig. 3, inv. nos. 39 and 101) are of hard dark ware, typically medieval; one has incised ornament on the lip. A small fragment, .15 in. thick, is covered with red and white pocked glaze, and may probably be assigned to the sixteenth century.

Inv. no. 29 (fig. 3) is a perforated disc or wheel-ornament, the spokes ending in short knobs beyond the circumference. The irregularity of the pattern and the bevelling of the edges of the perforations shews that the object has been cut and not stamped, and make it unlikely that it is of recent origin. The object was submitted to Mr. Tonnochy of the British Museum, who has replied that he thinks it is medieval, but, owing to war-emergency, specimens and subject-indices have been packed away and cannot be consulted for comparison.

Inv. no. 39 (fig. 3) is part of a bracelet or pendant of carboniferous shale, broken at each end, and roughly worked so that flakes have split off the surface. Through it has been bored a biconical perforation. Objects of this type are frequently found in medieval deposits; they probably came into use in early Christian times, and lasted until the fourteenth or fifteenth century.

Mention may be made of a broken hone of fine-grained micaceous sandstone (inv. no. 78), which would be available from the moraines. Its section is rectangular, and measures 1.5 x .4 ins.

A good many iron fragments were unearthed. The majority were pieces of stout nails of rectangular section⁽²¹⁾, typically medieval. There were also two clamps (inv. nos. 63 99). Several pieces of plates were found (inv. nos. 40 67 71); the first is probably part of an angular handle of a vessel, the purpose of the others is uncertain. Four portions of blades were dug up. Inv. no. 31 is too broken to be illustrated. Inv. no. 65 (fig. 4) is apparently a rusted knife or dagger whose edges have been broken. In the drawing an attempt has been made to restore what seems to be its original form. Under inv. no. 2 have been listed two articles found lying beside each other in the exposed face of the north-west scarp of the mound. One (fig. 4) is a broken knife with socketed handle made by bending round the wings of the blade, so that the socket lies entirely on one side. The blade has no midrib. The other is a thin plate ending in a solid handle which turns at right angles and then upwards; it seems to be a key, partly broken, as these turns are original features and not due to rust.

Inv. no. 14 (fig. 4) is a piece of iron three inches long, of cruciform section with a hollow tube. The wings taper slightly towards one end, though the midrib remains of constant width. The rusted condition of the object makes it impossible to specify its nature; but it seems most probable that it is a section of a stout sword, broken at both ends.

A great many bones were found on the top of the mound. The majority are broken and unsuitable for examination; but a fairly representative selection of teeth has been identified. The animals most frequently represented are deer

(20) *U.J.A.*, III, ii (1939), p. 254, pot H.

(21) Inv. nos. 10 16 17 27 36 37 73 77 78 79 100.

and pig. There is a fair amount of sheep, but little ox and horse. Mention has been made above of worked bones. Though the majority of these came from the south trench, a few were found on the top of the mound.

The charcoal has been kindly examined by Mr. M. Y. Orr of the Royal Botanic Gardens, Edinburgh. The selected specimens had been found in areas possibly undisturbed, as mentioned in the text above; but none can be dated with certainty. The trees most commonly represented are oak, ash and hazel; there is a small quantity of willow.

It has already been mentioned that much iron slag was found in the south trench, and that some water-worn pieces were picked up on the shore. There were two small pieces in the north pit, and a few fragments were found on top of the mound. Most of the slag is hard, heavy and rugose, usually fairly lumpy and with little sign of fusion even on the surface. It contains few gas-holes. Many pieces are fairly large, a few, up to six inches across, are roughly bun-shaped and may be regarded as furnace-bottoms. A few specimens are well fused and glassy, with large gas-holes; one flat piece probably ran on to the ground after tapping. There are also specimens of highly fused clay, presumably furnace-lining. The slag contains no copper, but a high percentage of iron⁽²²⁾. It has been smelted in primitive fashion, most probably in bowl-furnaces, as in the excavations no trace of a built furnace was found. The fuel was presumably charcoal, and on one piece of slag is the imprint of coarse-grained wood.

Traces of iron-smelting are commonly found on Irish medieval sites, and the production of iron was clearly carried out locally and not on an industrial scale. Pockets and nodules of ore are wide-spread and could be collected as required. Bog-deposits may sometimes have been used, for though they contain much phosphorus, it is doubtful if it would be reduced at the extremely low temperatures normally attainable. At Inishee we found ironstone nodules derived from the carboniferous limestone, which could have been smelted; there were also a few pieces of very siliceous and of very calcareous ironstone, perhaps derived from river-gravels, and suitable as flux. The amount of slag unearthed at Inishee does not in fact represent more than two or three charges, and if the whole island were excavated, it would probably not shew more than occasional smelting for local needs.

It is not easy to draw definite conclusions regarding the Inishee site. I think it probable that the levelling and scarping of the mound was carried out in the later middle ages, when there was some sort of settlement on the island, though the inhabitants seem to have been poor and not to have built permanent houses. To this date I would assign the hearths, and probably the ditch across the top. Perhaps of approximately the same date are the remains in the south trench, though I have given reasons for thinking that they are not in situ. There was also a prehistoric settlement; the most closely datable finds of this period seem to be late bronze-age, and the flint tools need not perhaps be earlier. This settlement would have been destroyed by levelling the mound, and the remains unearthed are consequently of a fragmentary character. But it is important to have established the existence of such a settlement, as evidence is accumulating for the continuation of the mesolithic fishing and food-gathering culture into the neolithic and bronze ages, and the island-site of Inishee may be added to the list.

(22) Analyses: From top of mound, inv. no. 21, fe 62.5%; inv. no. 57, fe 53.5%. From south trench, inv. no. 84, fe 60.6%; inv. no. 92, fe 59.1%; inv. no. 106, fe 47.8%.

MOIRY CASTLE.

By O. DAVIES.

The mountainous district of south Armagh has at all periods been of great strategic importance. Time and again, there have been hostilities between armies in Ulster and in Leinster, which have usually conducted military operations near the frontier. The strategic problem was apparently complicated by the part which the English played in these wars; this implied that the fighting between northerners and southerners was drawn eastward, towards the east end of their frontier-line. Thus, though the road through the Fews from Dundalk to Armagh is of prehistoric origin, its use would involve a long detour, it being of greater importance to secure the coast and to maintain sea-communications via Newry. So equally, the road to Armagh via Killeavy Camlough and Mount Norris never played a great part in history⁽¹⁾.

As soon as Dundalk rose to importance, the north road to Newry came into existence. In early times, this road crossed the river at Castletown ford⁽²⁾, and bore north-eastwards; by the seventeenth century there was a bridge at Dundalk. The road climbed fairly rapidly⁽³⁾ past Faughart to the densely forested mountains⁽⁴⁾. At the Gap of the North it crossed a marshy valley, and thence made for the Flurry at Jonesborough. Beyond this stream it pursued a straight course northward, along a narrow ridge which forms the easiest and driest route between a considerable area of lake and swamp on the west⁽⁵⁾, and the smaller bog of Carrickcarnan on the east. The modern main-road lies slightly east of the ancient, at the south end not more than 200 yards from it; but though its gradients are better, it runs along lower ground; the older route was more suitable, and its ridgeway-course is very archaic in appearance.

(1) This road is not shewn on Senex' Map (1712). It was however open in early times, for Boazio (c. 1600) marks Carrickbraddoc, now the pass of Carrickbroad.

(2) This ford was used until the late seventeenth century. This information, as some other in this paper, I have derived from an unpublished lecture delivered in Newry by the late Dr. D. Barcroft, of which a copy was lent to me by Mr. T. G. F. Paterson.

(3) For its line see fig. 1; also Senex' Map (1712). It is well illustrated on the Down Survey as "The Roads from Dundalk to Newry"; and its course can be traced with the aid of the county-boundary, though the townlands of this area are not inserted. On this map the road passed west of Fughen Church (Faughart), along the county-border past Moiry Castle, over Flurry Bridge, and thence to Newry, which it entered by the modern Ballybot Bridge, the Dublin Bridge being not earlier than the eighteenth century. The *Generelle Description of Ulster* (1609) marks certain dotted lines, believed to be the routes of the Commissioners. In south Armagh are two such, both from Forkill, one to Narrow Water approximately along a series of lanes marked by Rocque (see fig. 1, where the more certain lengths of this course are shewn as heavy lines), the other turning north near Carrickcarnan probably along the recognised Newry road. The southern stretch of the Newry-Dundalk road is not dotted, but the inclusion of places along it, Faughart New Fort and Moirie, shews that it was known. The road is shewn on a map of the same date of the Southern Part of Ulster. Its line coincides with that of the Down Survey, the only additional details being the causeway at Carrickcarnan and the insertion of "Chatterton Fort" on the left close to Newry.

(4) Cp. Fynes Morison, ii, p. 237, 305; also Janson's Map (1650), which marks only the Pass of Moiry and not the fort.

(5) This lake is shewn on Scale, *Hibernian Atlas* (1776, compiled indiscriminately and inconsistently from older sources). It must have covered the whole Plain of Meigh, seeing that Rocque (fig. 1) leaves the area between Aghadavoyle and Ballymacdermot blank.

We have several descriptions of the difficulties of this mountain-road, known as the Bothar a Mhaighre⁽⁶⁾, especially in its course through the Moiry Pass⁽⁷⁾. The principal obstacles were marshy valleys, more densely forested than the hill-slopes. Dr. Barcroft has pointed out that the word "Pass" or "Pace" in the sixteenth century was used for a valley-crossing rather than for a way over a range of mountains; and that roads normally ran along ridges, cutting across at the narrowest and driest points from slope to slope.

The Moiry Pass is thus described in 1595⁽⁸⁾: "The ordinary passage by the Moyrie to Dondalke was perillous; beinge a broaken cawsey besette on both sydes with bogges, where the Irish might skyppe but the English could not goe; and on the two endes (especially at the farther as they must march) it was naturally fenced with short and shrubbed wood in which the rebells lyinge might discharge theyr voleyces without danger to themeselves and with greate annoyance unto the passenger."

The Earl of Tyrone, in September, 1600, had fortified the pass by raising from mountain to mountain, from bog to bog, and from wood to wood long traverses with huge high flankers of great stones and turf, staked on both sides with wattled palisades⁽⁹⁾. The low-lying ground was crossed by a wooden causeway leading to a ford over the stream. This stream has generally been assumed to be the Three Mile Water, which flows beneath Moiry Castle⁽¹⁰⁾. But Fynes Morison⁽¹¹⁾ calls it the Four Mile Water or Flurry⁽¹²⁾; and a pamphlet of 1691 asserts that the fortifications were two miles distant from Moiry Castle⁽¹³⁾. Further, the description of the causeway suggests a larger work than would be needed to cross the valley below Moiry Castle⁽¹⁴⁾. In this case, by the Moiry Pass men in the seventeenth century understood not only the modern Gap of the North, but the whole forested stretch as far as Carrickcarnan or even further, and the causeway probably crossed the Carrickcarnan bog, with a ford at Jonesborough and the existing stone-bridge near the Customs Hut. It would have been felt that the road was adequately secured from the north by holding Newry, but that a fort was needed at the south end of the pass to prevent its being raided from the north-west⁽¹⁵⁾.

(6) Cp. *A.F.M. notes*, s.a. 1600, 1601.

(7) Ir. Bealach a Mhaighre. Called in an account of Bruce's War Invermullane by Kilsagart, and Emerdullam in a notice of 1343; cp. *U.J.A. O.S.* v (1857), p. 1: Tempest, *Guide to Dundalk*.

(8) *The Chronicle of Ireland*, ed. Wood (Irish Manuscripts Commission), p. 104.

(9) Fynes Morison, iii, p. 155; *Calendar of State Papers Ireland* (1600-1), p. 27.

(10) Dr. Barcroft assumes a slip by Morison. The *O.S.* gives no name to this stream, but in the *O.S. Letters Armagh* it is called the Abhain Docthur.

(11) ii, p. 305.

(12) There is no doubt about the identification of these rivers. Jonesborough was formerly called Four Mile House, and the bridge at Carrickcarnan Five Mile Bridge, see Senex' Map (1712), Scale, *Hibernian Atlas* (1776).

(13) Cp. *A True and Impartial History of the Most Material Occurrences in the Kingdom of Ireland*, publ. Chiswell, London (1691), p. 15; quoted below, p. 33. This pamphlet was kindly lent to me by Mr. T. G. F. Paterson.

(14) Cp. also *County Louth Archaeological Journal*, v (1921-4), p. 42, which definitely locates the causeway at Jonesborough.

(15) See below, p. 34, and fig. 1. My location of the causeway is proved by the 1609 map of the Southern Part of Ulster, which places it, under the name "Causie Moierie Causie," between Carrickcarnan and Cloghoge.

The detailed courses of the roads in Rocque's time are approximate, as there has probably been some straightening. In Louth only the more certain old roads are shewn, as there is no map corresponding to Rocque.

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In October, 1600, Mountjoy forced his way to the Moiry Pass. His army cut the thickest wood and mended the causeways, which had been intersected by Tyrone's trenches⁽¹⁶⁾. A recommendation was made in November to build two forts in the pass⁽¹⁷⁾. By the following May some English troops had perhaps been pushed forward to secure the pass⁽¹⁸⁾. At the beginning of June Mountjoy marched from Dundalk, and encamped at Faughart on June 8⁽¹⁹⁾. He had brought with him a Dutch engineer⁽²⁰⁾, who at once proceeded to build the bawn-wall of the castle⁽²¹⁾. On June 14, when this was defensible, Mountjoy moved northwards, encamping that night in the pass, and leaving workmen to build the keep, which had been finished before June 26⁽²²⁾.

The garrison at Moiry was unable to suppress brigandage in the mountains⁽²³⁾. So in 1624 a small fort was erected to command the crossing of the Flurry⁽²⁴⁾. It is shewn on Petty's Map as Waterfort. It must have stood on the spur just east of Flurrybridge; but its exact site is unknown. That this crossing could cause serious difficulties to an army is shewn by the following description of 1689⁽²⁵⁾:

"The army marched to Dundalk; in our way thither we found two Redoubts, nigh a place called the Four-mile-house⁽²⁶⁾; for *Mareschal de Rose*, the French General, was at Dundalk some time before our army approached, and enquiring whether the River was fordable, he found it was in several places; then he went on to Newry, and finding it a convenient Pass, he ordered it to be defended, at the same time commanding those Redoubts to be made, which if the enemy had mann'd, they might have given us no small diversion; for there are vast Mountains on each hand, and a Bog between them, through which there was only a Causeway with a deep Ditch, and a small Stone Bridge about the middle of it; at the farther end of the Causeway, the Forts were placed at a convenient distance one from another, from whence the *Irish* might easily have retired, if we had forced the Pass; for neither could our Horse follow, nor knew our Foot how to tread the Bogs after them: This place was formerly very woody, and was fortified by *O Neale*, Earl of Tyrone, against Sir *Charles Blunt*, Lord Deputy, which he found great difficulty in passing; but next year he built a Fort some two miles nearer Dundalk, called *Moyery Castle*; The Countrey between Newry and Dundalk, is one of the wildest places of all Ireland."

The old road from Dundalk to Jonesborough had been superseded before 1760 by a more direct way⁽²⁷⁾. Such straight roads were built in many parts of Ulster in the early eighteenth century; of about the same date was the straight

(16) *C.S.P.I.* (1600-1), p. 29; Fynes Morison, ii, p. 337.

(17) *C.S.P.I.* (1600-1), p. 23. The second was presumably on the site of the later Waterfort.

(18) In his general disposal of troops (May, 1601), Fynes Morison, ii, p. 386, mentions a garrison at Moiry. This may be antedating, but cp. also *C.S.P.I.* (1600-1), p. 346.

(19) Fynes Morison, ii, pp. 391f.

(20) *C.S.P.I.* (1601-3), p. 115.

(21) Fynes Morison, ii, p. 399.

(22) *C.S.P.I.* (1600-1), p. 401.

(23) Cp. *C.S.P.I.* (1608-10), p. 193.

(24) *C.S.P.I.* (1615-25), p. 512.

(25) *A True and Impartial History of the Most Material Occurrences in the Kingdom of Ireland*, publ. Chiswell, London (1691), pp. 14-15.

(26) Or Jonesborough, see above n. 12.

(27) See fig. 1; also Scale, *Hibernian Atlas*, which in Co. Louth incorrectly marks two roads running north from Dundalk.

road from Dundalk to Forkill, Lislea and Armagh. A new bridge was built at Newry, replacing Ballybot Bridge for southbound traffic. In the early nineteenth century the road was again reorganised so as no longer to pass through Jonesborough but up Ravensdale, and thence via Killen to Newry. With the advent of coaches, more attention was paid to gradients.

Moiry Castle is thus described in 1611⁽²⁸⁾: "A pretty castle upon the park of the Moyrye, built in the time of the late Earl of Devonshire's government here, at the Queen's charge, where Captain Anthony Smith is constable, and has a ward of 12 men. Has drawn some families of British to dwell upon the lands thereunto adjoining, which is a good relief to passengers between Dundalke and the Newrye."

Though its main function was to protect the pass, or perhaps the southern end of the pass, through the mountains, it must be emphasised that the site was chosen also to command roads and tracks from the west. Rocque marks two roads from near Drumintee (fig. 1); and though the principal traffic from this district passed through Carrickbroad Pass, these side-roads would enable marauders to molest the main-road and then escape into the forest.

As soon as completed, Moiry Castle was garrisoned⁽²⁹⁾. It would hold a constable, porter and sixteen warders, though the normal garrison was twelve⁽³⁰⁾. The constable, Anthony Smith, received lands round the castle, for which he paid a low rent, being in addition obliged to keep the castle in repair⁽³¹⁾. After a few years there was a dispute between Smith and Lord Moore concerning the boundary of the county and of the castle-estate, which was settled by the award of Sir Toby Caulfield and Dudley Norton⁽³²⁾. The castle was confirmed to the lessee and his heirs in 1620⁽³³⁾. In 1623 it was ordered to be strengthened⁽³⁴⁾.

A few years ago, Mr. Paterson called my attention to the precarious state of the castle. When I visited the owner, Mr. Murphy, he said that though the structure as a whole was sound, many of the top-stones were loose, and there was danger to cattle accustomed to shelter beneath. Owing to the historic nature of the castle, I determined to have it secured, so that it should not further deteriorate, and no owner should have an excuse for pulling it down. I obtained a grant from the Archaeological Section and from the Government, and employed Mr. Peter Tomany to carry out the work in August and early September, 1938. I used the opportunity to make a thorough architectural study of the castle, and carried out small excavations to determine the line of the bawn-wall. A more thorough excavation might indeed repay the trouble; but as I could not in that year devote my whole time to this work, I was forced to postpone it.

The castle is a square keep with rounded corners, built of rubble and mortar, with walls about four feet thick⁽³⁵⁾. It stands in the corner of the bawn, to which it is aligned diagonally. The external dimensions of the bawn are 95 x 72 ft., the mortared wall being about three feet thick. A fragment at the

(28) *C.S.P.I.* (1611-4), p. 127.

(29) *Cp. C.S.P.I.* (1601-3), p. 109, of 4/10/1601.

(30) *C.S.P.I.* (1603-6), pp. 510, 582.

(31) *C.S.P.I.* (1615-25), p. 284.

(32) Marsh's Library, Z 4-2-6, K.L. 18/7/1616, p. 537. This reference was given to me by Mr. Paterson.

(33) *Calendar of Patent Rolls*, 18 James I, 2 LXV. *Cp. County Louth Archaeological Journal*, vii (1929-32), p. 381.

(34) *C.S.P.I.* (1615-25), p. 430.

(35) North-east and south-west walls, 3½ ft., north-west 3½ ft., south-east 4½ ft.

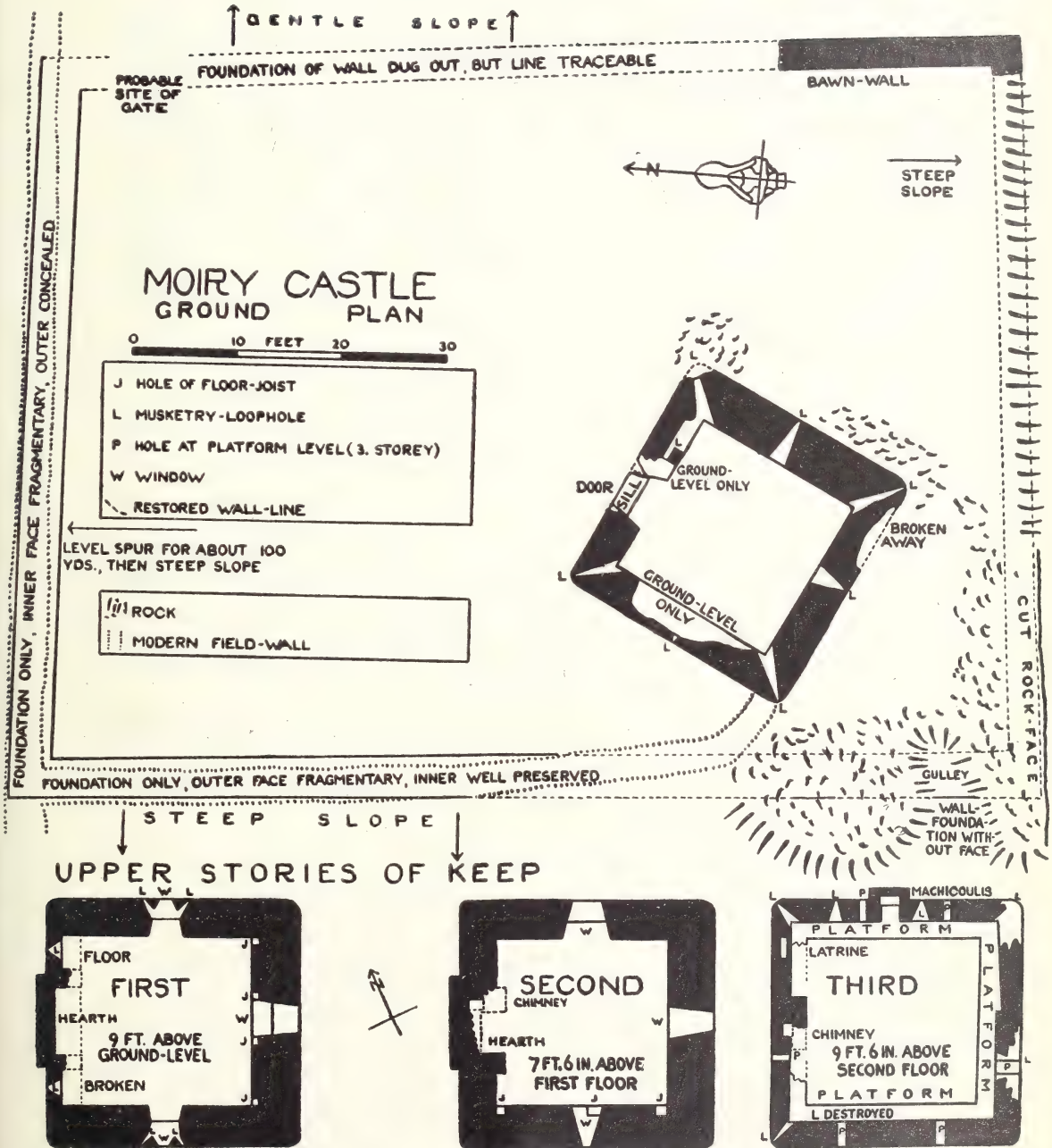


Fig. 2.

south-east corner survives to a height of nine feet, without coping. There seems to have been no corner-turret. On east and west the ground-level is much higher inside than outside the wall, perhaps owing to the accumulation of habitation-refuse. The south wall has disappeared; but its line is marked by a steep slope, and towards the west by a vertical rock-face, which seems to have been quarried to increase the height of the wall. The north end of the east wall has been dug away recently. The north and west walls are preserved in modern field-boundaries⁽³⁶⁾; the weathered faces of their foundation-courses were discovered by excavation. The south end of the west wall had disappeared owing to the high level of rock-outcrop; its line could not on this side be traced by a vertical cut in the rock, as it ran across the bedding-planes of the slate, so could not take advantage of such extra heightening. In the gully however I discovered a portion of the wall beneath the turf, though not its face. This sufficed to prove that it did not join the castle-wall as at Island MacHugh, but that the castle was free-standing inside the bawn.

Time did not permit of excavation to find the gate, but it must have been on the north or east, as the other sides are too steep. Also the road, which the castle guarded, passed below it on the east. The gate was probably in the east wall near the north-east corner, where for a short distance are no signs of recent excavation, suggesting that there were here no wall-remains. This would be opposite the castle-door. Presumably a track wound up to the gate from the road.

The castle-door was in the north-east wall. There survives a sill of rough boulders in the outer side of the wall, and the inner parts of two splaying jambs $5\frac{1}{2}$ ft. apart. The door is calculated to have been $3\frac{3}{4}$ ft. wide. The lintel has disappeared, and above it the wall has fallen away to a height of ten feet from the ground. The door is commanded from the east jamb by a loophole 9 ins. square along the thickness of the wall; this leads from a niche three feet back, just large enough to hold a man's head and pistol.

The north-west wall, below the chimney, has broken away nearly to ground-level. A breach above the loophole is probably not intentional, but due to some stones of the outer facing having fallen. Otherwise the ground- and first two floors are fairly well preserved. I think that the wall has been partly repointed since the original construction.

There is a loophole at each corner and in the centre of each side of the ground-floor. The outer apertures are 5 ins. high and $2\frac{1}{2}$ ins. wide, but they splay sideways and upwards to 2 ft. square. The sides are built regularly, the tops are stepped upwards by a series of lintels, a regular sixteenth-century feature. The corner-loopholes have two lintels on the inner face, one along each wall; the central ones are roofed with rough arches.

In the north-west wall of the first floor was the principal fireplace, a recess 2 ft. 9 ins. deep flanked by two walls which have mainly broken away. On the outer face is a projection $18\frac{1}{2}$ ft. high, rectangular for the first 11 ft., then narrowing to a flat apex. It rests on corbels through the thickness of the wall. Its purpose was to back the hearth-recess and chimney, as the wall is too narrow.

At either side of the first-floor fireplace is a roughly arched recess two feet deep. In each is a splaying loophole about four feet from the floor.

(36) North wall 4 ft. thick, west wall 3 ft. 9 ins. thick.

The windows on the other three sides are recessed to the floor. The sill of the south-eastern was apparently $4\frac{1}{2}$ ft. above floor-level, and the opening was 3 ft. high. It probably had cut-stone jambs, now disappeared. It was roofed with a flat arch. The other windows have also lost their stone frames. The south-western is covered by a flat arch, the north-eastern probably on the inner face by a beam or large slab, of which the sockets may be seen. Each window has a loophole on each side, the main aperture being presumably closed in times of danger by a shutter.

In the second floor the south-west window is built up on the outside. It was 2 ft. 9 ins. high with splaying jambs, the sill being 3 ft. above floor-level. On the south-east was a window of the same height. The outer frame was of rough stones, of which some survive. The north-east window was recessed to the floor. The beam roofing its inner face has disappeared, and it is in a semi-ruinous condition. The fireplace, in the north-west wall, is not as deep as that of the first floor, but the flanking walls projected inwards. The north wall has fallen away.

The walls of the third storey are reduced to half-thickness by an interior platform $1\frac{1}{2}$ ft. wide on all sides except beside the chimney. This reduction probably was to lighten the weight. The wall survives to a height of six feet at the north corner, but is elsewhere more deteriorated. An old drawing shews it somewhat higher, but without traces of a fourth floor. It is likely that the third storey was surmounted by a gabled or flat roof.

At the platform-level on all sides are openings one foot square through the walls, sloping slightly to the outer faces. They may have been used for large muskets. One might expect them to be drains; but there would be no point in so many, unless the third-storey walls are really a parapet, the roof rising from the platform; but for this they seem too high. It is also possible that these holes held beams to increase the width of the platform, as it was not floored, and manned only in times of siege.

There are fragmentary loopholes about three feet above platform-level in the north-east and south-east walls⁽³⁷⁾. Their interior frames measure 1 ft. 9 ins. wide by 1 ft. 3 ins. high, and their openings have stepped lintels like those on the ground-floor. The south-east loophole is partly constructed of broken fragments of brick $2\frac{1}{4}$ ins. thick; probably a cartload of old bricks was brought to the castle, but why they were used mainly at the loopholes is uncertain. Fragments of brick on the south-west wall suggested the site of another loophole. Traces of corner-loopholes survive at all corners save the south, at about $3\frac{1}{2}$ ft. above platform-level.

Above the door is a projection with ashlar quoins resting on three corbels through the wall. On the inner face is a recess two feet above the platform, beyond which is a hole 1 ft. by 2 ft. It was clearly a machicoulis for pouring boiling water on assailants.

On the north-west is another recess 1 ft. 2 ins. deep and 5 ft. 6 ins. high, roofed by a single block. It is closed in front by a slab 2 ft. high and 4 ins. thick, the hole behind sloping outwards through the wall, to a fairly rectangular

(37) The one near the north corner is $4\frac{1}{2}$ ft. above platform-level, the other in the north-east corner $3\frac{1}{2}$ ft. high.

opening in the outer face. This must have been a latrine, built on the side without windows save for the ground-floor loopholes.

There can have been no platform at the chimney, which projected internally, though the hood is partly broken away. Whether there was a central loophole in the north-west wall is uncertain; but part of it is deteriorated much more than the rest, as if there had been an opening there.

Moiry castle is a typical small sixteenth-century keep, like Island MacHugh. The massive constructions of the Norman period have given way to small towers, which in their turn were replaced at the Plantation by fortified manors of a more spacious type. One presumably mounted Moiry by means of ladders; other castles of this date have stairs in the thickness of the wall. The principal living-room was apparently on the first floor, and was probably occupied by the constable. The men may have camped in the bawn, as at Burt⁽³⁸⁾, or have lived on the upper stories. The normal garrison was twelve, though in emergencies, to judge from the number of loopholes, about twenty-five could be effectively accommodated. The castle was built entirely as a stronghold.

(38) *U.J.A.*, III, ii (1939), p. 190.

ANNUAL MEETING OF SOCIETY.

The Annual Meeting of Shareholders and Members was held in the Old Museum Buildings on Thursday, 9th November, 1939, at 3.30 p.m. to receive the Council's report for the past session, the Hon. Treasurer's Statement of Accounts, to elect five members to the Council of Management, and to transact such other business as may be brought forward pertaining to an annual meeting.

Among those present were Prof. T. Thomson Flynn, D.Sc., President (in the chair), Dr. S. W. Allworthy, M.A., Colonel Berry, M.R.I.A., Messrs. R. F. Blake, F.I.C., A. M'I. Cleland, Alec Davison, F.R.S.A.I., E. J. Elliott, Dr. E. E. Evans, M.A., J. W. Gillmour, J. T. Greeves, Professor Morton, M.A., D.Sc., A. G. Pomeroy, M.A., J. Skillen, Captain Turner, M.C., Prof. Gregg Wilson, M.A., D.Sc., and Arthur Deane (Hon. Secretary).

Apologies for inability to attend the meeting were received from Messrs. W. B. Burrowes (Hon. Treasurer), A. Albert Campbell, Dr. D. A. Chart, J. L. Cole, W. M. Crawford, Dr. R. H. Hunter, R. S. Lepper, and Captain James R. Young.

The Chairman called upon the Hon. Secretary to read the notice convening the meeting. It was also announced that the meeting had been advertised in all the local papers.

The Hon. Secretary read the Council's report which was as follows:—

ANNUAL REPORT.

Your Council is called upon to submit to the Shareholders and Members of the Society at this its 118th Annual Meeting the report for the past session, ending 31st October last.

The General Meetings have been of exceptional interest and importance during the present session, as all the lectures were delivered by Professors and Lecturers of Queen's University.

The Society has been always fortunate from its early inception in having the assistance, not only of the teaching staff of the University, but that of Queen's College before it; and even at an earlier date, of the Academical Institution, Dr. James L. Drummond being the Society's first President in 1821.

Owing to War conditions, the number of meetings during the coming session will be somewhat reduced and these will be held in the afternoon. Due notice of meetings will be sent to members; and the Council hopes that members will show their interest by attending as many as possible.

OBITUARIES.

It is with deep feelings of regret that your Council has to record the death of two old members of the Society, both of whom served on its Council for many years until their death, and also for several years on its Archaeological Committee, namely Mr. F. Adens Heron, D.L., and Mr. Godfrey W. Ferguson, J.P., F.R.I.B.A.

Mr. Heron, who died on the 2nd May last, was in his 91st year. He was a son of the late James Heron, a Director of the Ulster Bank, and was grandson of John Heron, first Chairman of this bank. He was also a nephew of the late William Cowan Heron, D.L., founder of the Cowan Heron Cottage Hospital at Dromore, a large landowner in Co. Down.

Mr. Godfrey Ferguson, who died on the 28th August last, was a well known Architect in the city. He was the son of the late Dr. Henry T. Ferguson and a cousin of the late Sir Samuel Ferguson, the noted poet and antiquary. Mr. Ferguson was a member of the Grand Jury for Co. Antrim and only a few years ago was High Sheriff of that County. His advice was of the greatest value to the Society during the reconditioning of the Old Museum Building.

Both deceased members were keenly interested in Social Welfare work of the city. Obituaries by Mr. R. S. Lepper appear on pages 43, 44.

Your Council also regrets to record the death of Mr. A. R. Hogg on the 25th August last. Mr. Hogg was a well known Belfast Commercial and Technical Photographer and for many years a member of the Society. For some time, and until his death, he acted as lanternist to the Society and was keenly interested in the study of archaeology, topography and natural history. He had a valuable and extensive collection of negatives illustrating these subjects, many of which were used in tourist and travel publications, or to make lantern slides for lectures on Ulster scenery.

DEAN CARMODY.

The Council having decided to secure a portrait sketch, by subscription, of the late Dean Carmody, entrusted Miss Eileen Ayrton to execute it. The Council feels that Miss Ayrton has been most successful in her work, and the subscribers now ask the Council to accept the portrait on behalf of the Society.

COUNCIL MEMBERS.

Your Council notes with great regret the continued absence of their colleague, Mr. W. M. Crawford, the Hon. Librarian, from the Council's deliberations. Mr. Crawford is at present in England, and it is satisfactory to know that his health is improving after an operation. We are looking forward to his speedy return among us.

Mr. A. Albert Campbell, who is also a member of Council, is recovering from an unfortunate accident and your Council hopes that he will soon be sufficiently well to take part in the activities of the Society.

SOCIETY'S REPRESENTATIVES.

Professor Gregg Wilson is now your representative on the local committee of the National Trust for Places of Historic Interest and Natural Beauty; Dr. E. E. Evans continues to represent your Society on the Ancient Monuments Advisory Council and Mr. E. J. Elliott represents your Society as a co-opted member on the Libraries, Museums and Art Committee.

SHAREHOLDERS AND MEMBERS.

Owing to deaths and conditions occasioned by the War, your Council regrets that the number of Shareholders and Members shows a falling off. The number is now 168 as compared with 181 in the previous year. No transfer of shares has been made during the year.

ARCHAEOLOGICAL SECTION.

The Archaeological Section continues its activities in the sphere of excavations, which have yielded much valuable information and material. Present conditions tend to make attendances at evening lectures very uncertain so that to a certain extent the programme of such lectures has been left in abeyance. The enthusiasm of the members of the Section has been encouraging.

The Archaeological Section wishes to record its indebtedness to Lord Enniskillen for permission to carry out an excavation, undertaken by Mr. O. Davies, at Inishee, Co. Fermanagh, which proves to be a settlement of much earlier date than that disclosed at the earlier excavation at Island M'Hugh.

Membership of the Congress of Archaeological Societies is being maintained, but in consequence of the War the Annual Congress fixed for the present year has been abandoned.

Whilst much has been achieved by the Section, more remains to be done and, given encouragement and support, the Section hopes that in the future it will be able to still further enhance its contribution to the accumulating knowledge of the pre-history of the Province.

THE BUILDING.

Your Agents, Messrs. Davison & Dickey, report that the building has remained fully occupied by good tenants during the past year, but the Northern Drama League have given Notice to Quit on 1st February, 1940, for financial reasons, and in anticipation of difficulties created by the outbreak of hostilities.

The Royal Society of Ulster Architects has renewed its Lease for a further fifteen years under similar conditions to its former holding.

The damage done by a bomb explosion in the street, and for which compensation had been allowed by the Recorder, has been made good. Two complete new ceilings have been put up, and numerous panes of glass replaced.

Steps have been taken to make the building conform to "black-out" restrictions by fitting blinds and substituting low-powered bulbs in the Hall and on the Staircase.

The income from the nightly lettings, amounting to £15 4s. 6d., is a reduction on last year, partly due to the black-out.

Now that the Public are getting used to the present conditions it is hoped that some of those who have cancelled lettings will carry on as usual, and that members will make known the advantages of the Lecture Room and Committee Room for meetings.

EXCHANGE OF PUBLICATIONS.

In the absence of Mr. Crawford, the Library work during the past year has been almost entirely of a routine nature, such as the acknowledgment of exchanges and distribution of the publications received between the Museum Library and the Library of Queen's University. It is gratifying to learn how much these publications are appreciated in these libraries by members and others.

PROCEEDINGS.

The Society has extended its publication policy by including original research by non-members. One paper by Messrs. G. Williams and A. E. Needham of Queen's University on the Resistance of *Modiolus Modiolus* to infection by the boring sponge, *Cliona*, was communicated by the President and printed in the Society's Proceedings for the previous session. Your Council hopes that further research work will be brought before the Society from time to time with a view to publication.

THE COUNCIL.

The Council has co-opted Dr. E. E. Evans, M.A., as a member of Council in place of the late Godfrey Ferguson, retiring in 1940. Four members are due

to retire this year, namely Professor Flynn, Dr. R. H. Hunter, Mr. R. S. Lepper, Professor W. B. Morton. All are eligible and offer themselves for re-election. A fifth shareholder or member must be elected in place of the late F. Adens Heron.

FINANCIAL STATEMENT.

Your Honorary Treasurer, Mr. W. B. Burrowes, regrets his inability to be present this afternoon owing to an important engagement in Dublin. He submits the Statement of Receipt and Expenditure which will be placed before the Local Government Auditor. He reports that the year commenced with a debit balance of £137 0s. 7d. The Bank Overdraft now amounts to £101 17s. 4d., which will be further reduced by subscriptions to come in.

The Rentals received last year amounted to £187 0s. 8d. and this year to £208 12s. 11d., which shows an increase of £21 12s. 3d. for the present year. A number of resignations have been received which affects the subscriptions.

It is hoped, he said, that there will be new members joining the Society, and if no large expenditure will be required for the Building our balance should be further reduced during 1940. A Statement of Receipts and Expenditure appears on pages 47 and 48.

ADOPTION OF REPORTS.

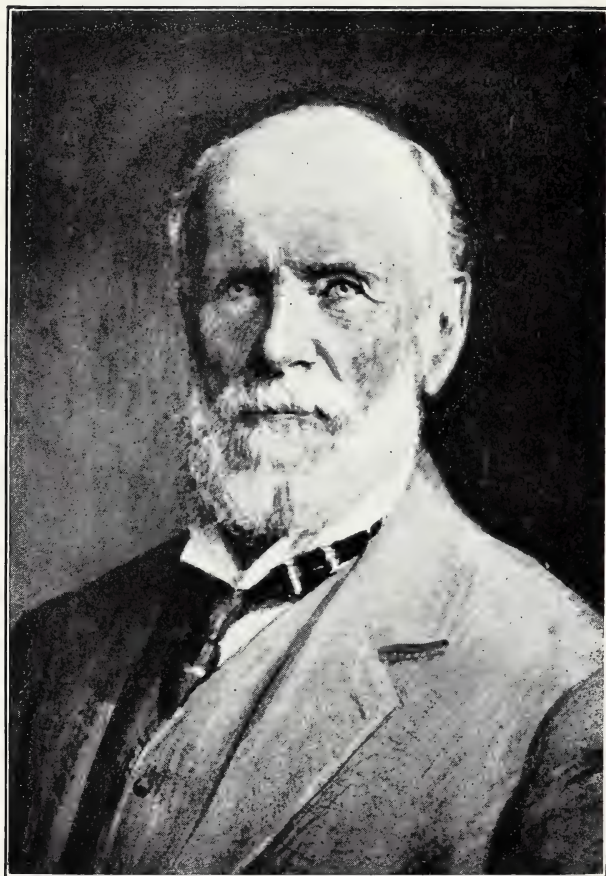
The reports were adopted on the proposition of the Chairman, seconded by Mr. A. G. Pomeroy, M.A.

ELECTION TO COUNCIL.

On the motion of Mr. J. W. Gillmour, seconded by Dr. S. W. Allworthy, Professor Flynn, Dr. R. H. Hunter, Mr. R. S. Lepper and Professor Morton were re-elected to the Council for a further period of three years.

Dr. Allworthy, in proposing Captain James R. Young to fill the vacancy caused by the death of Mr. F. Adens Heron, D.L., said that Captain Young was a Shareholder, his father had been Hon. Secretary of the Society for twenty-six years. It was stated that Captain Young was at present serving with the Army owing to the war. He moved that he be elected on the Council. This was seconded by Mr. E. J. Elliott and on being put to the meeting was carried unanimously.





FRANCIS ADENS HERON, D.L.
Died, 1939

From a water colour drawing by Frank McKelvey, R.H.A., in Belfast Art Gallery.

OBITUARIES.*

FRANCIS A. T. HERON, D.L., OF MARYFIELD,
HOLYWOOD, CO. DOWN.

With the death of Mr. Francis Adens Heron, D.L., on May 2nd, 1939, at the age of 90 the Society has lost an assiduous and keenly interested member of the Council, on which he had served from 1924 to 1939, having been also a member of the Archaeological Section from 1922 to 1929. He had joined the Society in 1919.

As is the case with so many old families in Ulster, the Herons originally hailed from Scotland, being probably a cadet branch of the Herons of Heron, or Kirroughtrie, near Newtown Stewart, Galloway, several of whose younger sons settled in Ulster during the seventeenth century, and who are now represented in Galloway by the Heron-Maxwells.

In 1679 one John Heron with his family arrived in Down—a month after the Scottish Covenanters had been crushed at Bothwell Brigg. They settled at Ballymacreeley, near Killinchy, and his farm there was in the possession of his direct descendants until recent years. From the third son of John—one Patrick, born 1660 and dying in 1744—Francis Heron of Maryfield was descended, for Patrick's son Thomas married Mary Edens and bought Tullyvery about 1745. They left a large family, one of whom, Francis, born 1750, married Jane, the daughter of the wealthy William Cowan of Kinallen, Dromore, and the six sons of this Francis and Jane were able and prosperous. Francis died in 1816. Their third son was John, who lived from 1780 to 1870 in Belfast and at Maryfield, Holywood, and was a founder and Director of the Ulster Bank. The fifth was James of Tullyvery and the sixth was Robert of Ardigon. John's eldest son, James, also a Director of the Ulster Bank, married Nerissa Hutton of Dublin and died in 1868, and their eldest son is the subject of this note, Francis Adens Theodore Heron. John's elder daughter, Jane, married Charles Lepper of Belfast and Demerara, and later became the wife of Robert Stewart Lepper of Trainfield House, and had children by both marriages.

Francis Adens Heron, eldest son of James and Nerissa, was born April 26th, 1849, and educated at the Belfast Academical Institution and Cheltenham. He was for many years engaged in the linen business. He married first Charlotte Amelia Langtree, a niece of the founder of Campbell College, and secondly Mary Smith of Edinburgh. He had three sons and five daughters. F. A. Heron inherited in 1917 the bulk of the Heron family wealth, the result of many generations of exceptional business ability and industry. He inherited, too, the traditions of culture, of wide reading and of a liking for travel, for though he was 68 when this wealth came to him, he began to travel extensively and also devoted more time to the interests of the arts and sciences. He was a generous supporter of Queen's University and a member of its Senate, a Governor of the Linenhall Library, the Hon. Secretary of the Royal Victoria Hospital, and President of the Cowan-Heron Hospital at Dromore, founded by his uncle, William Cowan Heron, D.L., second son of John Heron of Maryfield and a High Sheriff of Down.

*The original Notices have been condensed for publication in the Proceedings.—Ed.

F. A. Heron's private benefactions were substantial and unobtrusive, quite often being known only to himself and to the recipient. Erect, tall and dignified, a believer in the simple and active life of the country, abstemious almost to asceticism, and sprung from a long-lived stock, he kept to his great age a remarkable activity of mind and body.

R. S. L.

GODFREY W. FERGUSON, J.P., F.R.I.B.A., ARCHITECT.

Godfrey W. Ferguson, a member of the Society for forty years, died on August 28th, 1939, suddenly while on holiday. He was an architect of wide interests and activities; a worthy member of an old professional Co. Antrim family; the son of a leading physician residing in Belfast, who was before him a shareholder of the Society from 1856 till his death in 1890; and a cousin of the late Sir Samuel Ferguson, Q.C., LL.D., the noted Irish antiquary and poet.

Godfrey Ferguson designed the Belfast Cathedral School, the Thompson Memorial Home at Lisburn, and many banking offices and mansions. He was a Past President of the Belfast Literary Society and a Vice-President of the Belfast Branch of the British Empire Shakespeare Society. For five years from 1922 he was on the committee of the Archaeological Section, and in 1926 was co-opted a member of the Council.

In 1927 when, with the opening of the new Municipal Museum, the Belfast Corporation handed back to the Society the premises known to the town generally as the "Old Museum," the need for reconditioning arose, and Godfrey Ferguson became convener of the Property Committee of the Council, the object of which was to make the building a fit home for various learned Societies, an idea so long advocated by the late R. J. Welch. Funds were scanty and problems many, but the Belfast Corporation made a contribution and the work was done. The edifice was repaired and cleverly refitted to face its second century of work. Incidentally Ferguson discovered the existence of the original deed for the purchase of the site of the Old Museum by the young enthusiasts of Belfast who projected the Museum idea in the eighteen-twenties.

Godfrey Ferguson was for long a Justice of the Peace for Co. Antrim, serving as High Sheriff in 1935. He was Chairman of the Visiting Justices for H.M. Prison, and Hon. Treasurer of the Ulster Discharged Prisoners' Aid Society, and served for 30 years on the Committee of the Charitable Society.

He had ever a twinkle in his eye and stayed young to the end, for he saw humour in odd corners of life and always had a good story to tell, though often a terse one.

He was straight-forward with a strict sense of honour, and made many friends. Always fond of travel, in later life he took many journeys across the sea, preferring air transport. For many years he had attended the meetings of the British Association, and was one of the Local Secretaries at its Belfast Meeting in 1902, when Professor James Dewar was the President. Godfrey Ferguson's wife was Katherine H. Wales, daughter of Dr. Wales of Downham Market, Norfolk. They had no children and she died some years before him.

R. S. L.



GODFREY W. FERGUSON, J.P., F.R.I.B.A.
Died, 1939.



ARCHAEOLOGICAL SECTION.

ANNUAL MEETING.

The Annual Meeting of the Section was held on 17th November, 1939, Colonel R. G. Berry, M.R.I.A., presiding.

The members present were Messrs. O. Davies, A. Deane, J. T. Greeves, J. Skillen and the Honorary Secretary. Apologies were received from Messrs. A. A. Campbell, F. Cole, R. S. Lepper, and the Hon. Treasurer (W. B. Burrowes).

The Hon. Secretary of the Section read the following report:—

The Section continues its activities in the sphere of excavations, which still yield much valuable information.

Failure to attract audiences sufficiently encouraging to evening lectures, owing to endless counter-attractions, has resulted in a certain hesitancy on the part of the Section to arrange for such in the absence of any knowledge of the most probable date when members would be free. Nevertheless the enthusiasm of the greater proportion of the members of the Section has been most encouraging. A lecture on "Irish Kingship" by Colonel R. G. Berry evoked a useful discussion and revealed the great interest inherent in the Section which was gradually becoming more articulate—a most encouraging indication of the growing interest in the science of archaeology.

We record our indebtedness to Lord Enniskillen for permission to carry out an excavation, undertaken by Mr. O. Davies, at Inishee, Lough Macnean, Co. Fermanagh, which proved to be a settlement of much earlier date than that disclosed at the earlier excavation at Island MacHugh.

Membership of the Congress of Archaeological Societies is being maintained, but in consequence of the war the Annual Congress fixed for the present year has been abandoned.

Excavations were carried out not only at Inishee but at Island MacHugh, both by Mr. Oliver Davies. An account of the former excavation will appear in the Society's Proceedings for the present year and Mr. Davies reports briefly, in regard to the latter, that the excavations were carried out from the end of April until early in July. The most important object of this season's campaign, the uncovering of a large area of the neolithic stratum, was most successful. A great deal of neolithic pottery and flints were found, also a grain of wheat which proves that agriculture was known at that time. The discovery of a hone and the marks on the piles shews that the date is reasonably late, however primitive the pottery may look, and that metal was already known.

Much information was also gained as to the foundation of the island. The neolithic layer rests on brushwood pegged together with piles. The island may at that time have been just above water, and have been covered with birch and oak scrub. Fir grew on it mainly after the neolithic period. It had, however, not long before been a patch of reed. Mr. Mitchell was fortunately able to come from Dublin and to take borings, which proved that the island rests on a gravel-ridge about 8 ft. below normal water-level, on which had accumulated first mud and then reedy peat.

Shafts were dug also in the bailey and inside the castle, both to the neolithic layer. Some interesting pottery of the bronze age was found in the bailey, but on the whole the results here were rather meagre. The shaft in the castle has been refilled immediately for safety; that in the bailey has been partially filled temporarily, so that it can be reopened.

Two further areas have been started. Some medieval objects have been found, but excavations have not yet been carried down to the peat levels. It is proposed to dig one other large area, to extend slightly the area completed this year, owing to its extreme richness in early finds, and probably to carry out some tests to settle problems that may arise in writing the report.

While much work has been achieved, more remains to be done, and, given the continued encouragement of the Council of the Society and the support of individual members of the Section, we are hopeful that the coming year and the years to follow will continue to record in a still larger measure the Section's contribution to the accumulating knowledge of the pre-history of the Province.

The report was unanimously passed.

On the proposal of Mr. Deane, seconded by Mr. J. T. Greeves, Colonel R. G. Berry, M.R.I.A., was elected Chairman for the ensuing year. Mr. S. D. Thompson was elected Hon. Secretary on the proposal of Mr. Davies, seconded by Mr. J. T. Greeves. Mr. Deane further proposed, Mr. Davies seconding, that Miss Gaffikin, Messrs. A. A. Campbell, E. E. Evans, J. T. Greeves, R. S. Lepper and J. Skillen constitute the Committee, together with the statutory members—Prof. T. Thomson Flynn, D.Sc., M.R.I.A., Mr. A. Deane, F.R.S.E., Mr. W. B. Burrowes, F.R.S.A.I., and Mr. Oliver Davies, M.A.

After a general discussion on the work to be carried out during the coming season, the Chairman declared the meeting closed.

**THE ACCOUNT OF THE BELFAST NATURAL HISTORY AND PHILOSOPHICAL SOCIETY
FOR THE YEAR ENDED 31st OCTOBER, 1939.**

RECEIPTS.		PAYMENTS.	
To Subscriptions	£63 4 0	By Balance as per last Account	£137 0 7
" Dividends	13 1 0	" Rent, Rates and Taxes	19 8 1
" Rents	202 2 5	" Insurance	6 15 0
" Miscellaneous Receipts :—		" Salaries, Wages, and Insurance Stamps	58 5 2
Archaeology	£18 5 6	" Fuel and Light	36 5 6
Sundries, including £10		" Other Payments :—	
13s. 0d. Subscriptions to		Printing and Stationery	£62 11 5
Dean Carmody Memorial		Advertising	7 6 6
Fund	12 5 6	Archaeology	28 3 6
Balance against Account on 31st October, 1939	30 11 0		98 1 5
		Sundry Expenses, including	
		Dean Carmody Memorial	£18 0 10
		Fund £9 10s. 6d.	1 1 0
		Audit Fee	10 0 0
		Postages	9 0 0
		<i>Irish Naturalists' Journal</i>	7 14 0
		Lanterns and Slides	7 14 2
		Bank Interest and Charges	53 10 0
	<u>£409 5 9</u>		
York Street Flax Spinning Co., Ltd.,		4½ % Debentures, £400.	
			<u>£409 5 9</u>

We certify that the above is a true Account.

E. J. ELLIOTT, Governor.
W. B. BURROWES, Accounting Officer.
31st day of October, 1939.

I certify that the foregoing Account is correct.

W. R. MACONKEY, Comptroller and Auditor-General.
14th day of November, 1939.

The Account of The Belfast Natural History and Philosophical Society given on preceding page is in the form prescribed by the Local Government Board. It includes the subscriptions and expenses of the Archaeological Section, separate account for which is as follows:—

ARCHAEOLOGICAL SECTION.

1938.		1938.			
Oct.	To Balance ...	... £63 4 2	By Oliver Davies, M.A. ...	... £1 6 3	
"	" Subscriptions ...	... 17 15 6	" S. D. Thompson ...	... 0 7 1	
"	" Subsidy ...	... 8 7 6	" Congress of Archaeological Society ...	... 3 4 0	
			" Stationery, W. Sweeney ...	... 0 10 0	
			1939.		
			Feb. 13	" Northern Whig, Ltd. ...	... 0 18 6
			"	" W. Sweeney ...	... 0 10 3
			May 4	" O. Davies, M.A. ...	... 9 19 10
			July 21	" Do. ...	... 9 15 1
			Oct.	" Balance ...	£26 11 0
					... 62 16 2
		£89 7 2			£89 7 2

W. B. BURROWES.

EXCHANGES.

*Publications received during year.

-
- *ABO—Publications of the Abo Academy.
 - *ADDIS ABEBA—Bollettini di Idrobiologia, Caccia e Pesca della Africa Orientale Italiana.
 - *ALBANY—Bulletins of the New York State Museum.
 - *ANN ARBOR—Publications of the University of Michigan.
 - ATHENS—Publications of the Zoological Institute and Museum.
 - *AUCKLAND—Reports of the Auckland Institute and Museum.

 - *BASEL—Verhandlungen der Naturforschenden Gesellschaft in Basel.
 - *BERGEN—Publications of the Bergen Museum.
 - BERKELEY, CAL.—Publications of the University of California.
 - BERLIN—Publications of the Zoological Museum of Berlin University.
 - *BIRMINGHAM—Publications of the Birmingham Natural History and Philosophical Society.
 - BLOEMFONTEIN—Publications of the National Museum of South Africa.
 - BOSTON—Publications of the Boston Society of Natural History.
 - *BOULDER—Publications of the University of Colorado.
 - *BRIGHTON—Report of the Brighton and Hove Natural History and Philosophical Society.
 - BRISBANE—Memoirs of the Queensland Museum.
 - BRUSSELS—Annals Societe Royale Zoologique de Belgique.
 - * " Bulletin Societe Royale de Botanique de Belgique.
 - BUENOS AIRES—Anales del Museo Argentino de Ciencias Naturales.
 - BUFFALO—Bulletins of the Buffalo Society of Natural Sciences.

 - *CALCUTTA—Publications of the Geological Survey of India.
 - *CAMBRIDGE, MASS.—Publications of the Museum of Comparative Zoology.
 - CARDIFF—Transactions of the Cardiff Naturalists' Society.
 - CHICAGO—Publications of the Chicago Academy of Sciences.
 - *CINCINNATI—Publications of the Lloyd Library and Museum.
 - *COIMBRA—Publications of the Zoological Museum of the University of Coimbra.
 - *COLORADO SPRINGS—Publications of the Colorado College.
 - *COLUMBIA—Proceedings of the Missouri Academy of Science.
 - *COLUMBUS—Ohio Journal of Science.
 - * " Bulletin of the Ohio Biological Survey.
 - COVENTRY—Proceedings of the Coventry Natural History and Scientific Society.

 - DANZIG—Schriften Naturforschenden Gesellschaft.
 - DUBLIN—Proceedings of the Royal Dublin Society.

*EASTBOURNE—Transactions and Journal of the Eastbourne Natural History, Photographic and Literary Society.

EDINBURGH—Proceedings of the Royal Physical Society.

* „ Proceedings of the Royal Society of Edinburgh.

* „ Transactions and Proceedings of the Botanical Society of Edinburgh.

* „ Proceedings of the Society of Antiquaries of Scotland.

*EXETER—Proceedings of the Devon Archaeological Exploration Society.

GLASGOW—Transactions of the Geological Society of Glasgow.

GORLITZ—Publications of the Natural History Society of Gorlitz.

GOTEBORGS—Handlungar Regia Societas Scientiarum et Literarum Gotoburgensis.

*HALIFAX, N.S.—Proceedings of the Nova Scotian Institute of Science.

HOVE—Annual Report of the Brighton and Hove Natural History and Philosophical Society.

INDIANAPOLIS—Proceedings of the Indiana Academy of Science.

*ITHACA—Bulletins of the Cornell University Agricultural Experiment Station.

LA PLATA—"Manuferos Fossiles de la Republica Argentina."

*LAUSANNE—Memoirs and Bulletins de la Societe Vaudoise des Sciences Naturelles.

LAWRENCE—Bulletins of the University of Kansas.

*LIMA—Memorias Sociedad de Ingenieros del Peru.

LJUBLJANA, YUGOSLAVIA—Transactions of the Natural Science Society.

*LONDON—Publications of the British Museum (N.H.).

* „ Quarterly Journal of the Royal Microscopical Society.

* „ Publications of the British Association.

* „ Proceedings of the Royal Institute of Great Britain.

* „ Quarterly Journal of the Geological Society.

„ Publications of the Viking Society for Northern Research.

„ Reports of the National Trust.

*LOS ANGELES—Publications of the University of California in Los Angeles.

*LUND—Proceedings of the Royal Physiographic Society at Lund.

*MADISON—Transactions of the Wisconsin Academy of Sciences, Arts and Letters.

*MADRAS—Publications of the Government Museum, Madras.

„ Publications of the Madras Fisheries Department.

*MANCHESTER—Journal of the Manchester Geographical Society.

*MELBOURNE—Proceedings of the Royal Society of Victoria.

*MONTEVIDEOA—Archivos Sociedad de Biologia de Montevidea.

*MOSCOW—Bulletin de la Societe des Naturalistes de Moscow.

NEWCASTLE-UPON-TYNE—Proceedings of the University of Durham Philosophical Society.

*NEW HAVEN—Transactions of the Connecticut Academy of Arts and Sciences.

*NEW YORK—Annals and Transactions of the New York Academy of Sciences.

* „ Bulletins of the New York State Museum.

*OSLO—Publications of the University Library, Oslo.

*OTTAWA—Publications of the Geological Survey of Canada, Department of Mines.

* „ Publications of the Canadian Department of Agriculture.

*OXFORD—Proceedings and Report of the Ashmolean Natural History Society.

- PADOVA—Atti dell Accademia Scientifica.
- PHILADELPHIA—Proceedings of the Academy of Natural Sciences of Philadelphia.
- * „ „ Proceedings of the American Philosophical Society.
- *POLSKA—Annales Panstwowe Museum Zoologiczne.
- *PULLMAN—Research Studies of the State College of Washington.
- RENNES—Bulletin Geologique et Mineralogique de Bretagne.
- *RIGA—Publications of the Latvijas Universitates, Riga.
- * „ „ Professor Strand, F.L.S.—Folia Zoologica et Hydrobiologica.
- *RIO DE JANEIRO—Archivos do Instituto de Biologia Vegetal.
- „ „ Archivos Botanico do Rio de Janeiro.
- „ „ Publications of the National Museums of Brazil.
- * „ „ Publications of the Oswaldo Cruz Institute.
- ROCHESTER, N.Y.—Proceedings of the Rochester Academy of Science.
- *SAN DIEGO—Transactions of the San Diego Society of Natural History.
- SAN FRANCISCO—Proceedings of the California Academy of Sciences.
- *STILLWATER—Bulletins of the Oklahoma Agricultural and Mechanical College.
- *STIRLING—Transactions of the Stirling Natural History and Archaeological Society.
- *ST. LEONARDS-ON-SEA—Report of the Hastings and St. Leonards Natural History Society.
- „ „ Hastings and East Essex Naturalist.
- ST. LOUIS—Annual Report of the St. Louis Public Library.
- *STRATFORD—The Essex Naturalist.
- *STRAVANGER—Publications of the Stravanger Museum.
- *SYDNEY—Annual Report of the Technological Museum, Sydney.
- *TORONTO—Transactions and Proceedings of the Royal Canadian Institute.
- *TORQUAY—Transactions and Proceedings of the Torquay Natural History Society.
- UPSALA—Bulletin of the Geological Institution of the University of Upsala.
- VIENNA—Verhandlungen Zoologisch-Botanischen Gesellschaft.
- *WASHINGTON—Annual Report of the Smithsonian Institution.
- * „ „ Proceedings of the United States National Museum.
- * „ „ Smithsonian Institution, Miscellaneous Collections.
- * „ „ Publications of the United States Geological Survey.
- * „ „ Publications of the United States Department of Agriculture.
- „ „ Bulletin of the Bureau of American Ethnology.
- *WELSHPOOL—Publications of the Powys-land Club.
- *YORK—Annual Report of the Yorkshire Philosophical Society.
- *ZURICH—Publications of the Natural History Society of Zurich.

BELFAST NATURAL HISTORY AND
PHILOSOPHICAL SOCIETY.

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1940.

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} Retire
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aTurner, S., Ballyskeagh, Barnett's Road,	do.
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aWaterhouse, Mrs., 92 Malone Road,	do.
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Wright, W. S., Mossvale, Aghalee,	Co. Antrim
*Young, Captain J. R., F.R.I.B.A., Rathvarne, Chichester Park,	Belfast

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PRESENTED

7 MAY 1946



